TEAM EFFECTIVENESS IN ORGANIZATIONAL CONTEXTS

Dissertation

for the Faculty of Economics, Business Administration
and Information Technology
of the University of Zurich

to achieve the title of
Doctor of Philosophy
in Management and Economics

presented by
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from Germany

approved in October 2010 at the request of
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and
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Zurich, October 27th, 2010

Chairman of the Doctoral Committee: Prof. Dr. Dieter Pfaff

Preface

No one is able to produce a great work without experience, nor fill an influential position immediately. In the interval between initial failure and subsequent success, in the gap between who we wish to be one day and who we are at present, conflicts and setbacks are hardly avoidable. The tempting belief that achievement must come easily or not at all needs to be corrected because it is ruinous in its effect. It can lead to premature withdrawal from challenging, but worthwhile and realizable objectives. Eventually, almost everything valuable legitimately demands endurance and superior effort. Knowing that this idea is anything but banal, Friedrich Nietzsche made a couple of helpful recommendations for writing novels:

> *"The recipe for becoming a good novelist…is easy to give, but to carry it out presupposes qualities one is accustomed to overlook when one says "I do not have enough talent." One has only to make a hundred or so sketches for novels, none longer than two pages but of such distinctiveness that every word in them is necessary; one should write down anecdotes every day until one has learnt how to give them the most pregnant and effective form; one should be tireless in collecting and describing human types and characters; one should above all relate things to others and listen to others relate, keeping one's eyes and ears open for the effect produced on those present, one should, finally, reflect on the motives of human actions, disdain no signpost for instruction about them and be a collector of these things by day and night. One should continue in this many-sided exercise for some ten years; what is then created in the workshop…will be fit to go out into the world."*[1]

[1] Nietzsche and Hollingdale (1996, p. 87)

I think his statements are most widely transferable to writing a dissertation. For instance, I know now that the clumsiness of my first written attempts was not a sign of congenital incapacity for the task. Similarly, I am now able to better understand the colossal authorial struggles, the multitude of required additions and revisions behind the final work.

However, my mere intrinsic motivation would have been insufficient to write this book. That is why I would like to express my appreciation for those who gave me the opportunity and supported me throughout the last years. I am much obliged for the privilege to pursue my studies in fertile collaboration with my supervisor at the Chair of Strategic Management and Business Policy at the University of Zurich, Prof. Dr. Egon Franck. He sharpened my economic thinking by sharing his profound knowledge in the broader field of institutional economics and his experience in scientific writing. His high degree of confidence in my research projects has been a steady source of motivation for me. I am also grateful to my colleagues at the Institute of Strategy and Business Economics, not only for valuable comments on various problems I encountered during my research, but also for the stimulating exchange of ideas. Among them, I particularly thank my more experienced colleagues and co-authors Dr. Leif Brandes and Dr. Stephan Nüesch for the exciting cooperation. In addition, I give thanks to Dr. Rudolf-Carl Meiler and the ThyssenKrupp Steel AG for the trust in my abilities and the financial support of my work. Finally, I thank my parents, who actually deserve the lion share of my gratitude for their continuous, unconditional support throughout the last 28 years.

Zurich, August 2010 Jan Pieper

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1 Introduction

Every profit-oriented organization attempts to efficiently combine and process input factors in order to sell the final product at the highest price possible. An important aspect, which conventional economic thinking occasionally neglects is the fundamental difference between labor and all other input factors. A business can simply substitute coal with natural gas, switch off a prohibitively expensive production line, or reallocate its available assets. Employees, in contrast, react to given incentives, suffer from unfavorable working conditions, and potentially protest against them. Their behavior is largely driven by emotions, beliefs, and subjective perceptions. Subsequent frictions between the economic imperative to realize a profit and the human imperative to strive for financial security, respect, and tenure are hardly avoidable. Eventually, the economic one must prevail due to the very logic of the commercial system. However, this does not necessarily imply that employees' economic and psychological well-being is merely incidental. A better understanding of the complexity of human behavior in work contexts can and should help shaping employee-employer relationships, which are not unilaterally exploitative but enduringly mutually beneficial.

This relatively young research field can be subsumed under the term *personnel economics*. It benefits from partly competitive and partly cooperative, but eventually fruitful debates between different social sciences that study all kinds of management issues related to the employment relationship.

The key part of the economic approach is to focus on how the environmental variables (e.g., resources, information, incentives, constraints, decisions) affect the outcome. The rigorous and strictly analytical mainstream economic theory (e.g.,

theory of production, agency theory, contract theory) typically generates a statement of one or more important tradeoffs between costs and benefits that must be balanced. Associated properties like (over-)simplified assumptions and a high level of abstraction can be mitigated by incorporating more applied research from social and organizational psychology. These research fields also investigate environmental variables, but focus rather on their impact on human behavior. Considering the relation between human behavior and the generation of economically relevant output, potential complementarities between both perspectives are obvious.

As the title of this book suggests, I narrow the focus within this broad framework on the increasingly relevant subfield of teamwork and team processes in organizational contexts. But what precisely is a team in an organizational setting? Among a variety of definitions offered, I chose one by Cohen and Bailey (1997) because it embraces all aspects I consider relevant for my elaborations: „A (work) team is a collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems (for example, business unit or the corporation), and who manage their relationships across organizational boundaries“ (p. 241).[2]

Teams are particularly interesting for investigation because their use as a key element of the organizational architecture has expanded dramatically within the last decades in response to competitive challenges (Parker, 1993; Smith, 1997; Rock and Pratt, 2002). Individuals working together in a cooperative manner to attain shared goals usually achieve something beyond the capabilities of individuals working alone (Kozlowski and Bell, 2003). The specialization of tasks and the division of work as traditional economic explanations may be suitable when ac-

[2] I will use the words “team” and “group” interchangeably, although I more frequently use the term “team”. The management literature seems to prefer the term “team” (e.g., self-managing teams, project teams, and team effectiveness), whereas the word “group” is more commonly used in the academic literature that is influenced by social psychological research (e.g., group cohesion, group dynamics, and group effectiveness).

tivities are stable and predictable, but the contemporary organization is forced to respond ever more quickly and adaptively to shifting circumstances. Such situations can only be mastered by combining diverse but collaboratively related competencies, skills, knowledge, and experiences (Tjosvold, Johnson, Johnson, and Sun, 2003). A better understanding of the underlying team processes will enable organizations to retool human resource systems and managers to select, develop, and reward personnel for effective teamwork.

In this book, I attempt to contribute to the literature on teams in organizational contexts by addressing three specific issues that currently challenge scholars. Despite a considerable degree of coherence, they are not based on each other and their related literatures are largely independent. Thus, the interested reader is free to self-select the preferred sequence of chapter 2, 3, and 4. In the following, I will briefly outline the basic background information, the resultant motivation for each research question, and my main contributions.

In chapter 2 “Team Specific Human Capital as a Source of Superior Team Performance”, I empirically investigate the performance effect of team-specific human capital in highly interactive teams. A team’s stock of specific human capital refers to its members’ shared experience in working together. In a mutual learning-by-doing process, the team improves its ability to synchronize individual actions according to each member’s responsibility. As the acquired skills are largely implicit and non-codifiable, I discuss whether team-specific human capital constitutes a critical resource for achieving a sustained competitive advantage according to the tenets of the resource-based view (Barney, 1991). The idea of typical learning functions suggests that within-team cooperation cannot infinitely improve as the stock of team-specific human capital increases. A newly composed team initially possesses a large potential for learning-based improvements, but the attainment of such improvements corresponds to a reduction of the remaining learning potential (see Yelle, 1979; Dutton and Thomas, 1984 for reviews). I, therefore,

hypothesize that a team's stock of specific human capital positively affects team performance, but at diminishing rates.

The difficulty of finding proxy variables that appropriately represent unobservable resources has hitherto hampered empirical testing (Godfrey and Hill, 1995; Hoskisson, Hitt, Wan, and Yiu, 1999). In order to test my hypotheses, I make use of a large panel data set of teams appearing in the highest German soccer league, the *Bundesliga*. Contrary to many other industries, the sports business is an ideal labor market laboratory. Accurate measures of individual and team performance are easily available and hypotheses may be tested in relatively controlled field environments. Competing teams tend to have similar organizational structures and pursue similar or identical objectives (Koning, 2003). I argue that soccer in particular offers a well-suited platform for addressing my research question because the output of a soccer team (i.e., the match result) is clearly driven by the interaction of its members' conjunctive tasks. Within specialized but relatively flexible tactical roles, the players' ability to interact almost intuitively is required to execute their collaboration with precision.

Holding a team's stock of general human capital (i.e., playing talent) and other potential drivers constant, I find support for my prediction. Implications concerning investment decisions into human capital as well as the transferability of my findings to other contexts are discussed.

In chapter 3 "How Expectations Affect Managerial Change", I am also concerned with team performance but my focus is rather on team leadership and changes in the leader position. More specifically, I empirically investigate the antecedents of the decision to terminate a managerial employment.

Sooner or later, every organization faces the decision whether to dismiss an underperforming manager and hope for a positive shock effect or to prolong his employment and hope for disappointing results to be only temporary. Due to the unquestioned economic relevance of the decision, many scholars have been concerned with investigating managerial change and its associated contingencies. The

results, however, remain largely contradictory. What scholars consistently emphasize is the importance of performance expectations. But so far, the problem to adequately specify expectations has only deficiently been solved in empirical studies. A related drawback of many existing studies is that they are incapable of estimating deviations from expectations because they lack objective and reliable performance data that the managers can be held accountable for.

I attempt to address these obstacles in order to derive more valid conclusions. Like in chapter 2, I choose the domain of soccer matches from the German *Bundesliga* over other industries because of the considerable advantages for empirical investigations. Thus, I consider the coach of a professional sports team to be the analogy of a manager in a firm. My innovative specification of performance expectations is based on supplementary data on betting odds. These prediction market prices are continuously updated and aggregate all relevant information available until shortly before the match (e.g., relative playing strength, relative coaching quality, season aspirations, momentum effects, unforeseen player injuries). Moreover, a large public interest in the clubs' personnel decisions and the corresponding media coverage facilitate an accurate distinction between voluntary and involuntary dismissals.

Following prospect theory, which predicts how people choose between alternatives that involve risk (Kahneman and Tversky, 1979), I hypothesize that (i) the probability of a coach dismissal increases with expectations, even after controlling for the actual performance of the team and (ii) that coaches are more likely to be fired if they fall short of expectations, compared to peers with equal performance who meet or beat expectations. Holding other potential drivers constant, I find supportive evidence for both hypotheses. Based on my conclusion that expectations affect managerial change even beyond the actual performance, I derive practical recommendations and make some suggestions for future research.

Chapter 4 "Motives for Social Identity Processes in Organizations" is a conceptual work in which I try to challenge conventional wisdom about the motives for social identity processes in organizational contexts. Social identity as a sense of self,

derived from membership in social groups, helps people to navigate their social lives, work-wise or other. There are all kinds of social groups (e.g., family, friends, neighbors, sport teams, music bands, political parties, religious communities), which differ by the degree to which group members interact with one another, the group's importance to its members, the extent to which members share outcomes and common goals, and their similarity to each other (Lickel et al., 2000). Within the portfolio of social identities, the workplace plays a highly constitutive role in the evaluation of self and others. This is revealed, for instance, in the commonness to ask new acquaintances: "What do you do for a living?" And for two basic reasons this is hardly surprising. First, most people spend a major part of their lifetime at work. Second, most working people do not ply on their trade in isolation but rather as part of a team with interdependent tasks and shared responsibility for outcomes.

Social identity theory has been employed in many social sciences to account for collective goals and joint concerns, but also to explain inter-group behavior. For the investigation of social behavior in organizational settings, the theory is particularly suited because organizations are internally structured groups, which are located in complex networks of inter-group relations that are characterized by power, status, and prestige differentials (Hogg and Terry, 2000).

The presently limited explanatory power of respective studies, however, largely stems from their too narrow focus of on the human motive to affiliate with groups that are distinctive and positively valued in order to enhance self-esteem (i.e., the self-esteem hypothesis).

My aim is to advance the understanding of social identity processes in organizational settings by incorporating significant theoretical developments from more recent, predominately psychological research on another central motive, namely the need to reduce uncertainty about one's social identity.

I provide a substantiated and comprehensive discussion on the relationship between both motives and reveal that the need for uncertainty reduction is more fundamental. The reduction of uncertainty about self can be considered prerequisite

for the logically subsequent pursuit of self-esteem. Thus, I expect both motives for social identity processes to be sequentially interrelated. Particularly in highly structured social environments like organizations, the need for self-esteem is subject to a set of limitations. Moreover, I show that both motives differ substantially in terms of their conditions for activation and their motivational consequences.

My conceptual improvement allows me to explain largely inconsistent and unreliable empirical evidence on the self-esteem hypothesis (e.g., Abrams and Hogg, 1988; Hogg and Abrams, 1990, 1993; Rubin and Hewstone, 1998).

In a subsequent step, I apply my extended theoretical framework to gain further insight in the performance effects of different contextual factors in organizational design, comprising relative-pay schemes, internal labor markets, tacit knowledge integration, and team-level diversity. In order to help frame future research directions in the study of social identity processes and social behavior in organizational context, I derive a variety of more or less specific, but testable, propositions. Additionally, I point out concrete research avenues that are most promising to benefit from my approach.

2 Specific Human Capital as a Source of Superior Team Performance[3]

2.1 Introduction

The resource-based view of the firm proposes that superior performance can be explained by differentials in the endowment of valuable and rare resources. A positive competitive outcome can be sustained as long as both adequate substitutes are not available and isolating mechanisms protect critical resources from imitation (Rumelt, 1987; Barney, 1991). These resources can be both tangible and intangible assets that a firm controls. However, in dynamic and competitive environments that characterize many markets (Bettis and Hitt, 1995), intangible resources are more likely to make a persistent competitive advantage possible (Miller and Shamsie, 1996). According to Barney (1986), an effective isolating mechanism of intangible resources often stems from their inability to be transferred through the market mechanism. More generally, Reed and DeFillippi (1990) argue that the height of barriers to imitation is contingent upon the extent to which the critical resource is observable. Unobservable resources are tacit, diffused throughout the organization, or socially embedded. In particular, organizational routines are described by these characteristics (Nelson and Winter, 1982; Reed and DeFillippi, 1990). As it is impossible to empirically capture an unobservable resource (Godfrey and Hill, 1995) strategy researchers are forced to employ proxy variables

[3] A revised version of this chapter was published in Franck, E., Nüesch, S., and Pieper, J. (2011). Specific human capital as a source of superior team performance. Schmalenbach Business Review, 63, 376-392.

that may represent the underlying constructs in a more or less appropriate way. The difficulty of finding good proxies for critical resources has hitherto hampered the empirical testing of hypotheses proposed by scholars of the resource-based view (Godfrey and Hill, 1995; Hoskisson, Hitt, Wan, and Yiu, 1999).

In this chapter, I empirically investigate the question of whether a team's shared experience, i.e., its stock of team-specific human capital, as an intangible and unobservable resource, positively affects team output. Scholars who have attempted to quantify specific human capital have used measures such as tenure (e.g., Sandell and Shapiro, 1980; Berman, Down, and Hill, 2002) or qualitative survey data about various organizational factors (e.g., Hansen and Wernerfelt, 1989). We, in contrast, measure team-specific human capital by the actual number of deployments for the current team in a competitive context. I argue that my proxy measure better reflects the members' cumulative experience in cooperating than does pure tenure. Unlike other papers, such as Berman et al. (2002), I explicitly distinguish between the separate effects of specific and general human capital on performance. As a proxy measure for the team's stock of general human capital, I use estimates of the team members' market potential that are primarily driven by general components of human capital. Using panel data of 25 different soccer teams in the German *Bundesliga*, with a total of 3,672 match observations, my empirical analysis is based on a larger sample than that used by any other related study. Thus, I believe that this study will make a unique contribution to the empirical literature relating specific human capital to team performance.

2.2 Conceptual Framework and Hypotheses

In the following section, I first examine whether team-specific human capital qualifies as a critical resource for achieving a sustained competitive advantage. According to the resource-based view, a critical resource must add value to the firm,

it must be rare, it must be inimitable and it must not be substitutable by an alternative resource (Barney, 1991). Here, I discuss the four criteria individually, in order. I then refer to learning effects and hence infer my hypothesis about a curvilinear relationship between a team's stock of team-specific human capital and team performance. As team members accumulate experience in working together, the team's stock of team-specific human capital increases. Although this asset is valuable because it improves the team's interaction quality and, thus, its success, its accumulation is subject to diminishing returns. In order to gain further insight into the relevance of within-team learning processes, I also investigate the effect of the heterogeneity concerning team-specific human capital on team performance. Moreover, I try to shed some light on the moderating effect of the team leader's team-specific human capital.

2.2.1 Is Specific Human Capital Valuable?

Following Becker (1964), the human capital literature often distinguishes between specific and general human capital. Specific human capital refers to skills, experiences, and knowledge that are useful only to a single employer or industry, whereas general human capital (such as literacy) is freely transferable because it is useful to several employers. In view of this distinction, it has to be considered that purely general and purely specific human capital merely constitute theoretical poles on a continuum that allows for any mixed form in between (Thurow, 1970). Williamson (1985), when remarking on human asset specificity, notes that it generates a quasi-rent. Generally, a quasi-rent refers to the difference between the productivity in the current deployment and the second-best alternative. Thus, the degree of specificity corresponds to the scale of the quasi-rent. In the case of purely general human capital, there is no quasi-rent at all. According to Williamson (1975), the main reason why the value of specific human capital is lost when the employer changes is that its components are idiosyncratic. Both Becker (1962)

and Williamson (1975) emphasize that idiosyncrasies depend on the duration of the transaction relationship because they are acquired in a continuous learning-by-doing process. In a team context, where each member's specific human capital is only valuable to the current team, this implies that, ceteris paribus, the utility of this asset depends on the stability of the workforce, i.e., the team members' tenure (Berman, Down, and Hill, 2002). Alchian (1982) considers the perfect immobility of specific human capital to be the main reason for stable employer-employee relationships and even for the existence of firms.

However, the logic of specificity does not necessarily imply a positive net value. The underlying calculus is typically an investment decision. A profit-maximizing decision maker will only invest in the accumulation of specific human capital as long as the expected profits induced by the investment more than compensate for the accompanying costs, discounted to the present value (Franz, 1996).

Some work in the area of utility analysis provides both a theoretical foundation and techniques for empirically investigating increases in value due to human capital, but this work does not distinguish between general and specific human capital (Schmidt, Hunter, and Pearlman, 1979; Boudreau, 1983; Cascio and Ramos, 1986). This body of literature strongly argues that higher-quality human resources add value to firms.

A few studies have attempted to measurably distinguish between general and specific human capital in order to isolate their respective effects, despite Blaug's (1976) claim that such a distinction is all but impossible. Sandell and Shapiro (1980) investigated the impact that young women's ex ante preferences for future labor force attachment have on their human capital accumulation and pay. The authors used years of labor market experience as a proxy variable for general human capital and years of tenure with the current employer as a proxy variable for specific human capital. They determined that continuing gender differentials in job tenure and in cumulative work experience explain a large part of the gender differential in earnings and that women's relative earnings increase when their work experience and job tenure increase. Unfortunately, productivity effects were not

directly investigated. However, the combined effects of general and specific training as a major determinant of wages and wage growth among young women indicate at least a partial productivity increase, as wage growth cannot be completely explained by seniority.

In their study on the impact of shared experience on the performance of basketball teams, Berman, Down, and Hill (2002) used a similar conceptualization for their independent variable. Tenure, as measured by a weighted average of prior seasons for the current team, was found to be a highly significant determinant of team performance. In order to control for general player quality, the authors use the team members' average draft position.

Hansen and Wernerfelt (1989) investigated the relative explanatory power of economic and organizational factors in explaining inter-firm differences in profit rates. As a proxy for firm-specific resources, they utilized a questionnaire (Survey of Organizations, SOO) that captures many dimensions of organizational factors such as decision-making practices, goal emphasis, and job design as well as the characteristics of communication flow, the emphasis on human resources, and the organization of work. Their findings show that industry explains 19 percent of the variance in profit rates but that organizational characteristics, including specific human capital, are about twice as important. Based on these arguments and findings, specific human capital can reasonably be assumed to be a valuable resource. But is specific human capital also a rare resource?

2.2.2 Is Specific Human Capital Rare?

Generally, I agree with Wright, McMahan, and McWilliams (1994), who argue that if output depends at least to a certain extent on human capital, which allows for variance in individual contributions, then these skills should be normally distributed in the population. Hence, high-quality human resources should be rare. Moreover, both general and specific human capital are characterized by the fact

that their accumulation is costly (at the minimum in terms of time), but only the former is available through the market mechanism. In other words, there is by definition no supply of specific human capital beyond the internal labor market, although there should be demand, as specific human capital adds value to the firm. These properties support the description of specific human capital as rare.

2.2.3 Is Specific Human Capital Inimitable?

Given that specific human capital is valuable and rare, is it also inimitable? If a competitive advantage that stems from the accumulation of specific human capital is easily imitated, then it is not possible to sustain superior performance. In order to imitate, competitors must first be able to precisely identify the source of competitive advantage. They then must be able to copy both the critical components of the specific human capital and the circumstances under which these work. The specific human capital generated in a continuous learning-by-doing-process is unlikely to be imitated because it is to a large extent implicit (Doeringer and Piore, 1971; Franck, 1995). Through cumulative experience, certain processes become so internalized that their successful execution happens unconsciously and cannot be verbally explained. The implicit character of specific human capital makes it all but impossible to formalize (Lippman and Rumelt, 1982) and thus impedes imitation.

This is true for individual employees and even more so for highly interactive teams performing a common task. A team's stock of specific human capital consists of a socially complex interaction of implicit and non-codifiable skills. As this asset increases through a mutual learning-by-doing process, the team improves its ability to synchronize individual actions according to each member's responsibility. In this respect, I follow Weick and Robert's (1993) notion of the collective mind representing the specific human capital that is collectively held by a group of individuals. This asset is diffused among the team members, of whom each only

has access to a part of the overall stock of the team-specific human capital. Thus, it is impossible to dissect the complexity of interactions in order to isolate individual contributions to team output (Wright, McMahan, and McWilliams 1994). The fact that in team production, the total output typically exceeds the sum of its members' inputs further complicates the problem of identifying critical resources (Alchian and Demsetz, 1972). Even in team production processes that are openly observable to externals, there is causal ambiguity concerning the reasons for superior performance (Reed and DeFillippi, 1990; Powell, Lovallo, and Caringal, 2006).

At the extreme, luring away the entire workforce of a competitor seems to be a way to circumvent both the causal ambiguity and the immobility of specific human capital, but this approach neglects that a team's effectiveness may be tightly coupled to other resources of the firm (Wright, McMahan, and McWilliams, 1994). A team's effectiveness may further depend on relationships with other teams or on unique historical circumstances (Alchian and Demsetz, 1972). Thus, specific human capital is safe from being imitated. In all likelihood, competitors are neither able to identify the source of competitive advantage nor able to copy the critical components of the specific human capital and the circumstances under which these work.

Porter (1985), however, argues that "… barriers to imitation are never insurmountable." If other teams could identify the source of competitive advantage and imitate it, then the barriers to imitation would still be contingent on the cost of imitation. In the case of specific human capital, imitation is costly, especially in terms of time. Therefore, scholars of the resource-based view would propose that high performance could be sustained for some time at least.

2.2.4 Is Specific Human Capital Non-Substitutable?

Finally, specific human capital must not be substitutable if it is to be a critical resource of sustained competitive advantage. To the extent that other resources are

able to offset performance increments attributable to specific human capital, specific human capital by itself does not have the potential to give rise to sustained competitive advantage. In order to address the question of substitutability, it is important to note that the only resources that can substitute for specific human capital are, in their own right, valuable, rare, inimitable and non-substitutable. Accordingly, the benefits from a team's stock of specific human capital can indeed be eroded by other resources such as, for example, a competing team's additional investment in its stock of general human capital or its application of a superior technology. However, neither is capable of consistently substituting for specific human capital because these resources are available for purchase in the marketplace. Their free imitability prevents them from acting as a source of sustained competitive advantage (Wright, McMahan, and McWilliams, 1994). Hence, a team's stock of specific human capital is unlikely to be substituted because the requirements for a substitutive resource are difficult to meet.

In summary, a team's stock of specific human capital is valuable and rare, cannot be imitated, and is unlikely to be substituted. Based on these observations, I assume a positive relationship between a team's stock of team-specific human capital and team performance.

Hypothesis 1a:

There is a positive relationship between a team's stock of team-specific human capital and team performance.

2.2.5 Learning Effects

The learning-curve phenomenon is well known. As an organization gains experience, organizational performance improves at a decreasing rate. Scholars have extensively researched learning curves, and managers have often used learning

curves for planning purposes (Argote, 1999).

When members of a team accumulate specific human capital in a constant learning process that facilitates their interaction, several theoretical arguments suggest that these learning effects are subject to diminishing returns. Over the last 50 years, the phenomenon of diminishing returns as a consequence of typical learning effects has also been empirically well documented (see Yelle, 1979 and Dutton and Thomas, 1984 for reviews). The main argument is that there is a limit to the returns of team-specific human capital and that this limit is determined by the production technology. Team cooperation cannot infinitely improve as the stock of team-specific human capital increases. Hence, there are typical learning-curve effects. A newly composed team initially possesses a large potential for learning-based improvements, but the attainment of such improvements corresponds to a reduction of the remaining learning potential. Studying learning effects in 50 R&D teams, Katz (1982) found the relationship between shared team experience and team performance, as hypothesized, to be concave in shape. He concluded that

> *"...the upward slope in performance probably reflects the positive effects of learning and team building as new project members contribute fresh ideas and approaches while also developing a better understanding of each other's capabilities, of the technologies involved, and of their working relationships. Such positive effects, however, appear to taper off for teams whose members have continued to work together for a long period of time."* (p. 98).

In line with theoretical arguments and empirical findings, I assume the relationship between a team's stock of team-specific human capital and team performance not to be linear but concave in shape.

Hypothesis 1b:

The relationship between team-specific human capital and team performance is subject to diminishing returns. The positive performance effects of team-specific human capital will decline as shared experience grows.

2.2.6 Heterogeneity of Team-Specific Human Capital

Although a team's total stock of team-specific human capital is central to my theoretical predictions, the composition of team members concerning their individual working experience with the team may also matter. One viewpoint is that the team's composition requires continuity for mutual learning processes to improve interaction and to induce positive returns, especially if the successful accomplishment of complex team tasks requires complementary skills. In performing conjunctive tasks, one member's lack of certain skills cannot be compensated by other team members' superior skills (Kremer, 1993). This argument suggests that a team should be rather homogeneous in terms of their members' tenure. The heterogeneity of team-specific human capital within a team may also create more distant relationships between team members that impair the exchange of information and thus the quality of interaction (Ancona and Caldwell, 1992). In some instances, heterogeneity may create distrust, as widely dissimilar group members may have different vocabularies, paradigms, and even objectives.

Another viewpoint is that homogeneity may be counterproductive if there are too many status-seeking members because the team's (implicit) hierarchy is insufficiently differentiated (Overbeck, Correll, and Park, 2005). It can be fruitful to expose team members to new perspectives. From this viewpoint, the most successful teams may consist of a combination of experienced members who possess a lot of team-specific human capital and new members who supply fresh ideas. Also, the introduction of new team members may circumvent free-riding tendencies and

productively increase competition within the team (e.g., Alchian and Demsetz, 1972; Holmstrom, 1982).

In line with these contradictory perspectives, empirical findings have been mixed. Some studies have shown a negative relationship between tenure heterogeneity and different performance measures, such as innovation (O'Reilly and Flatt, 1989), adaptive change in a sample of electronics firms (O'Reilly, Snyder, and Boothe, 1993), and informal communication within the team (Smith et al., 1994). Berman, Down, and Hill (2002) found no significant relationship between tenure heterogeneity and team performance in professional basketball. Using data from the airline industry, Hambrick, Cho, and Chen (1996) found evidence for a positive link between tenure heterogeneity and two measures of performance. Despite the inconsistent theoretical predictions and inconclusive empirical results, I expect a higher stock of shared experience to be beneficial given the high degree of team members' interactivity in the production process of a soccer match. Hence, I assume heterogeneity of team-specific human capital to have a negative effect on team performance.

Hypothesis 2:

There is a negative relationship between the heterogeneity of team-specific human capital and team performance.

2.2.7 Team Leader's Team-Specific Human Capital

Beyond the compositional aspects of the team itself, the most obvious moderators of any team's performance are its leadership and changes in leadership. In their review of executive succession research, Kesner and Sebora (1994) note: "… few if any transitions at other organizational levels have as profound an effect either

inside or outside the firm." (p. 357). Aldrich and Pfeffer (1976) suggest hiring executives from other organizations as a means of facilitating the transfer of skills and technology across organizations. Generally, the effect of leadership (dis-) continuity on organizational performance has been widely researched, but conclusions are mixed. For example, Lieberson and O'Connor (1972) investigated the relationship between changes in the chief executive officer (CEO) position and subsequent developments in company performance indicators such as sales and profits. They found little evidence of any relationship. Weiner and Mahoney (1981) found stronger evidence of a leadership effect. Also, Virany, Tushman, and Romanelli (1992) drew positive conclusions about the performance effects of changes in the CEO position in their study of US computer equipment manufacturers. Denis and Denis (1995) found that forced resignations of top managers tend to be preceded by large declines in operating performance and followed by strong recoveries. Normal retirements tend to be followed by more moderate improvements on average. Carroll (1984), on the contrary, found that a managerial change among U.S. newspaper publishers was typically followed by a decline in performance. However, empirical investigations of the effect of leadership (dis-) continuity on performance face several intricacies. According to Koning (2003), there are three difficulties. The first difficulty is the measurement of performance. The more complex the structure of a firm, the more difficult it is to isolate a single person's impact on performance. Also, the measurement of performance may be complicated because the interests of the firm's decision makers are not necessarily aligned but may, on the contrary, diverge substantially. The second difficulty is observing if and when a manager is fired, as firms usually have no particular interest in publicly disclosing information about internal hiring and firing decisions. The last difficulty is due to the fact that a managerial change is typically accompanied by simultaneous changes, which impede an investigation under the ceteris paribus condition. It is all but impossible to assess what part of the change in performance can be attributed to the change in the leadership position and what part stems from the change in the conditions faced by the old and the new manager, respectively.

These obstacles give rise to a strong tradition of research based on team sports data within the empirical literature (see Audas, Dobson, and Goddard, 2002 for a review). The position in sports analogous to an executive is a head coach.

Eitzen and Yetman (1972), for example, investigated the impact of changes in the coaching position in college basketball teams. Based on their data, the authors concluded that coaching shifts do not affect performance. However, they found that the relationship between coaching tenure and team performance is suggestive of a learning curve: as coaching tenure increases, team success increases, but at diminishing rates. Porter and Scully (1982) also found a positive correlation between a coach's tenure and team performance in professional baseball that is comparable to that of an individual star player. Scully (1995) provides further evidence of a significantly positive relationship between a coach's tenure and team performance for baseball, basketball and American football.

In line with these findings, I argue that a team leader's team-specific human capital, i.e., his experience in leading the same team, positively affects team performance. However, I also expect teams with a higher stock of team-specific human capital to profit less from a leader with a lot of team-specific human capital than do teams with a lower stock of team-specific human capital. In other words, maintaining continuity of team leadership on teams with low levels of team-specific human capital is important to allow for learning processes to rapidly progress among team members. In sum, I expect a team leader's team-specific human capital to interact non-monotonically with his team's stock of team-specific human capital to affect team performance.

Hypothesis 3:

The team leader's team-specific human capital interacts non-monotonically with his team's team-specific human capital to affect cooperation. The positive effects of a team leader's team-specific human capital on team performance will decline as the team's stock of team-specific human capital grows.

2.3 Methodology

In order to test my hypotheses, I studied a large panel of match-level data of teams appearing in the highest German soccer league, the *Bundesliga*. I agree with Kahn (2000) that the sports business is an ideal labor market laboratory. Due to the frequency and regularity of athletic events, large and reliable data sets that contain accurate measures of individual and team performance are easily available. Unlike in many other industries, hypotheses may be tested in relatively controlled field environments. Competing teams in any sport tend to have similar organizational structures and pursue similar or identical objectives, and the production process is clearly defined by a detailed catalogue of rules of the game, which are enforced by independent referees (Koning, 2003). I argue that soccer in particular offers an exceptionally well-suited platform for investigating the impact of a team's stock of specific knowledge on team performance.

Unlike sports in which team productivity depends on disjunctive tasks (e.g., baseball), the output of a soccer team is clearly driven by the interaction of its members' conjunctive tasks. An offense player will be unlikely to score if his teammates do not support him with offensive passes. Similarly, a defender can hardly avoid conceding a goal if his team's midfielders constantly give misplaced passes (Franck and Nüesch, forthcoming). Also, the different tactical positions are not as narrowly circumscribed as, e.g., in baseball or American football (Katz, 2001). This means that in soccer, each player principally acts according to the responsibilities of his tactical position and predominantly interacts with players of adjacent tactical positions. However, depending on the situation, any player can get involved in offense or defense and may interact with any other team member.[4]

The required interaction of specialized but relatively flexible tactical roles, in combination with the speed of the game, makes team-specific human capital criti-

[4] The goalkeeper constitutes an exception because he is subject to a set of additional rules. As the only player who is allowed to use his hands within his own penalty area he very rarely leaves his tactical position.

cal in professional soccer. When there is no time to verbally coordinate individual actions, the players' ability to cooperate almost intuitively is required to execute their collaboration with precision. This becomes obvious if one thinks of a player who wants to pass the ball to a teammate. The passing player has to anticipate where the receiving player is going to run, and equally, the latter has to predict where the ball is going to be passed. Simultaneously, both players have to perceive and even anticipate their opponents' actions in order to adapt to them. In a professional soccer match, a countless number of these types of actions must be conducted very quickly in order to be successful, leaving little time for explicit communication. The high interaction level requires that teammates have shared experience in playing as a team. Although in professional soccer, the final team performance occurs in front of thousands of spectators in the venue and is televised, the implicit character of team-specific human capital still creates causal ambiguity, which means that it is all but impossible for both the team and its rival to determine what exactly generates superior performance (Reed and DeFillippi, 1990; Powell, Lovallo, and Caringal, 2006). Furthermore, the pool of potential substitute resources for team-specific human capital is limited because all competing teams use identical technologies, as defined by the precise specification of the production process of a soccer match.

2.3.1 Data

The sample consists of a panel of 1,177 players whom I recorded in 50,412 player-match-observations from the 2001/02 season to the 2006/07 season of the highest German soccer league, the *Bundesliga*. From the player-match data set, I aggregate the team's average in team-specific human capital and other team composition variables for 3,672 team-match-observations. In each season, which begins in August and runs through May of the following year, each of the league's 18 teams plays each other team in one home and one away match, resulting in 34 matches

per team and season. Due to the relegation of the three lowest-ranked teams and the promotion of the three highest-ranked teams of the second *Bundesliga* at the end of the season, my study sample comprises 25 teams. Most of the data I employ in this study are freely available on the Internet (*www.fussballdaten.de*). The players' market values were collected from special editions of *Kicker,* the most prominent German soccer magazine. All teams and their respective presence in the *Bundesliga* within the timeframe of the data set are listed in Appendix A.

2.3.2 Dependent Variable

Team performance. In a soccer match, team performance is always a relative outcome that reflects the playing quality of one team in comparison to the opposing team. Each team's output is easily measurable because the team that scores more goals than its opponent wins three points, and the losing team gets zero points. If both teams score an equal number of goals, then the match is counted a draw and both teams get one point. Within a league, teams are ranked according to the sum of their points won. In cases where two or more teams possess an equal number of points, their relative positions are determined by the difference between goals scored and goals received. Hence, each team has an incentive not only to win the match but also to do so with a goal difference that is as large as possible. Because my data set allows investigation on the team-match level, I consider the goal difference the best way to reflect the presence of a competitive advantage.

2.3.3 Independent Variables

Team-specific human capital. It is difficult to accurately distinguish between specific and general human capital because both are simultaneously developed and

both can be expected to influence a team's performance. However, a player's team-specific human capital is clearly expunged the moment he leaves his team, whereas he continuously gains experience, as a form of general human capital, throughout his entire career, regardless of the number of clubs he plays for. Therefore, I consider the number of previous appearances in league matches played for the current team to be a reasonable proxy of a player's team-specific human capital. On the team-match level, I build the average of this measure over all fielded players. See the Appendix B for a sample calculation.

I also include the squared value of the variable to allow for the hypothesized concave form of the relationship between team-specific human capital and team performance.

Heterogeneity of team-specific human capital. As a proxy variable for a team's heterogeneity in terms of team-specific human capital, I calculate the standard deviation of all fielded players' number of prior appearances for the current team on a team-match level. This variable is needed to test hypothesis 2 and to gain further insight into the relationship between the heterogeneity of team-specific human capital and team performance.

The coach's team-specific human capital. Changes in a soccer team's coaching position are not unusual and are well publicized due to the high transparency of the production process and the large public interest in the clubs' choice of coach. Frick (1998) found that in the German *Bundesliga,* a head coach's mean tenure amounts to 12.5 months. However, I do not measure the coach's team-specific human capital in terms of time; rather, analogously to my conceptualization of team-specific human capital, I measure it by the number of matches coached with the current team before the match in question. I expect a positive correlation between the measures for coaching experience with the team and team performance because leadership continuity allows for learning processes to progress among team members. In order to test hypothesis 3, that the coach's experience with the

same team interacts non-monotonically with his players' team-specific human capital to affect team performance, I introduce an interaction term of the coach's team-specific human capital with his team's stock of team-specific human capital.

2.3.4 Control Variables

Difference in general human capital. I control for a team's stock of general human capital because it is open to scrutiny that a newly composed team with virtually no specific human capital at all but with a lot of expensive superstars (i.e., a larger stock of general human capital) is likely to beat a team that has a great deal of experience playing together (i.e., a larger stock of team-specific human capital) but that is comprised of unknown average players. Thus, a team's competitive advantage due to its members' comparatively larger experience in playing with each other can be offset by a competing team's additional investment in its stock of general human capital. However, as discussed above, the benefits gained from additional general human capital are not safe from imitation because the services of higher-quality players can be bought on the transfer market.

I argue that a player's general human capital can be approximated by predicted start-of-season market values. In the *Bundesliga* clubs do not have to publish their players' market values. The *Kicker* soccer magazine, however, began to publish respective proxies in the mid-1990s. These proxies are likely to be consistent because the market values have been estimated in a systematic manner for several years by largely unchanged editorial staff. They have already been used in several empirical studies on the German soccer league (see Lehmann and Weigand, 1999; Swieter, 2000; Forrest and Simmons, 2002; Hübl and Swieter, 2000; Littkemann and Kleist, 2002; Haas, Kocher, and Sutter, 2004; Franck and Nüesch, 2009; Franck and Nüesch, forthcoming).

A player's performance is not only transparently observable during the match; also training sessions are usually open to the public (Franck, 1995). A wide public

interest in players' backgrounds and private life works as an additional monitoring mechanism and reduces behavior that could adversely affect performance. With minimal information asymmetries concerning a player's capabilities, I expect predicted market values to adequately comprise all general human capital components. As market values represent the price that another team is willing to pay for the services of a certain player, market values should accurately reflect that player's transferable general human capital. Team-specific human capital is not incorporated into market values because it is by definition immobile. Forrest and Simmons (2002) show that in European soccer, high market values clearly increase field success.

Following Depken (1999), I use the logarithm of estimated market values as a control variable for the team's stock of general human capital. Market values are expressed in 2003 Euros and are adjusted for inflation. Because the match is my unit of observation, I can easily take the opposing team's stock of general human capital into account to calculate the teams' relative advantage. Subsequently, I first take the logarithm of each team's sum of its fielded players' estimated market values and then calculate the difference between the opposing teams.

Age. I include a variable for the player's age in the regression as a proxy variable for a player's experience and general physical condition. The age of each player is calculated for each team-match observation by taking the difference between the date of the match day and the player's date of birth. For ease of interpretation, I convert this from days to years and then calculate an average for each team-match observation. Although it is impossible to make a definite distinction between young and old players, age is generally connected with greater experience with the game. However, physical abilities such as speed, stamina, and the ability to continuously recover within short intervals from exhausting performances tend to gradually deteriorate from a certain age onwards.[5] Simultaneously, the risk of inju-

[5] Frick, Pietzner, and Prinz (2007) found a statistically positive influence of player age on the probability of

ry increases. Only about 8 percent of all player careers in the Bundesliga from the 1963/64 season to the 2002/03 season lasted for 10 seasons and more (Frick, Pietzner, and Prinz 2007). At the same time, physical abilities constitute a necessary condition for team-specific human capital to induce positive returns. A player's team-specific human capital can only contribute to his team's performance as long as he is at the same fitness level as his younger teammates. If his physical shape drops below a certain threshold level, he will no longer be selected to play in the competition team (Lucifora and Simmons 2003).

As I have argued above, I expect the relationship between a team's average age and its performance to be curvilinear in shape. Therefore, I also include the square of the age variable in the model.

A potential problem with the use of the age variable is that it is likely to covary with the players' market values. However, I include it in the model because the simple aging of players could affect performance beyond the market values. In addition, it is important to account for age in the context of this study. Otherwise, the simple aging of players would be difficult to reject as the main reason for diminishing returns in performance at increasing levels of shared team-specific human capital.

Age heterogeneity. To generate a measure of age heterogeneity, I calculate the standard deviation of the fielded player's age on a team-match level. The integration of this control variable is necessary in order to rule out age heterogeneity as an alternative explanation for hypothesis 2, in which I predict the heterogeneity of team-specific human capital to be negatively related to team performance.

Home advantage. In order to control for potential home field advantage, I include a dummy variable that takes the value 1 in the case of a home match and 0 in the case of an away match. Carmichael and Thomas (2005) showed that home field

being eliminated from the *Bundesliga* while controlling for a series of individual characteristics, position dummies, region of origin dummies, and institutional characteristics. In my study sample the quantil $Q_{.9}$ in terms of player age is 32.5 years.

factors, e.g., a dominant fan base in the stadium and familiarity effects, positively influence the effectiveness of the home team.

Relative suspension time. After receiving a red card, the affected player has to leave the field immediately, leaving the team at a numerical disadvantage for the rest of the match.[6] This disadvantage is not negligible concerning the outcome of the match, which was shown by Franck and Nüesch (forthcoming), who analyzed the results of 1,530 matches in the *Bundesliga.* The authors found that red cards significantly influence the final score of a match, with a coefficient of -0.287. However, a variable that denotes the mere number of received red cards does not differentiate in terms of the time that the team has to perform in a numerically reduced formation. It makes a difference whether the player is expelled from the field in the 1st or in the 90th minute of the match. Equally, it is important whether the opposing team is numerically reduced because of red cards as well. If two players of opposing teams are simultaneously expelled from the field, then the respective disadvantages should cancel each other. Thus, I build the sum of the fielded players' time on pitch for both opposing teams and then calculate the difference between them.[7]

Difference in number of substitutions. Despite the fact that in a typical soccer

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6 Law 12 of the FIFA Laws of the Game lists the categories of misconduct for which a player may be sent off. These are: 1. Serious foul play (a violent foul), 2. Violent conduct (any other act of violence), 3. Spitting at anyone, 4. A deliberate handling offense to deny an obvious goal-scoring opportunity by any player other than a goalkeeper in his own penalty area, 5. Committing an offence that denies an opponent an obvious goal-scoring opportunity, 6. Using offensive, insulting or abusive language or gestures, 7. Receiving a second caution (yellow card) in one game (see, for example at: www.fifa.com/worldfootball/lawsofthegame.html/).

7 For illustration purposes, consider the following example: Team A plays against team B. In a 90-minute match, none of team A's eleven players receives a red card. This results in a total of 990 minutes on the pitch for team A. One player on team B receives a red card in the 40th minute of the match. This results in a total of 940 minutes on the pitch for team B. The variable takes the value -50 (= 940 - 990) for team A and 50 (= 990 - 940) for team B.

match, most teams exploit the maximum of three substitutions,[8] Franck and Nüesch (2009) still found a positive relationship between the number of substitutions and the match outcome. Thus, I also control for the difference in the number of substitutions because this measure takes into account that the two teams' potential advantages due to substitutions may offset each other.

2.3.5 Analysis and Results

It is well known that panel data require special econometric modeling in the form of either pooled regression or random modeling or fixed-effects modeling. An F-test following a fixed-effects regression indicates that there are significant team-level effects (F-statistics: 4.48 and 4.67) implying that pooled OLS would be inappropriate. In order to decide whether the team-level effects are random or fixed, I performed the Hausman specification test (Hausman, 1978), which compares the fixed-effects model with the random-effects model. The results show that team-level effects would be modeled inadequately by a random-effects model (Chi-square statistics: 6.33 and 109.39). Furthermore, I use an unbalanced panel due to the promotion and relegation of teams in European soccer and the reason for why a team gets promoted or relegated (called attrition) is not random. Instead, it is likely to be correlated with unobserved team playing strength, which may cause biased estimates due to resulting sample selection. This aspect supports the use of a fixed-effects approach because fixed-effects analysis allows for the attrition to be correlated with the constant unobserved effect (Wooldridge, 2003).[9]

Table 1 presents descriptive statistics and correlations. The mean values for goal difference, difference in market values and difference in time spent on the

[8] In my study sample, teams deploy an average of 13.73 fielded players per match (which corresponds to 2.73 substitutions per match).

[9] See, e.g., Kyriazidou (1997) for a procedure to also account for non-constant selection effects.

pitch have to be zero by definition. A correlation above 0.9 is found for the team-specific human capital measure and its square as well as for the age measure and its square with respective variance inflation factors (VIFs) of above 10.[10] Despite the high correlations, I do not drop the squared terms from the model, as the requirement of unbiased estimates is not necessarily violated. High degrees of correlation between the independent variables are really no different than using a small sample size, as the variance of the coefficient estimates increases in both cases, which may lead to statistical insignificance (Wooldridge 2003). Additionally, I argue that the concerned squared terms should not be dropped from the model because theoretical arguments and empirical evidence support my predictions that the respective relationships will be concave in shape. Ignoring these non-linearities would lead to biased estimates.

Table 1: Variables, Descriptive Statistics, and Pearson Correlation Coefficients

	Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9
1	Goal difference	0	1.83									
2	Team-specific HC	61.3	19.15	.13***								
3	Team-specific HC squared	4121.8	2638.88	.13***	.98***							
4	Coach's team-specific HC	70.3	81.58	-.03	.13***	.12***						
5	Difference in general HC	0	0.6679	.33***	.45***	.45***	.04*					
6	Age	9946.8	407.34	.01	.14***	.13***	-.09***	-.03*				
7	Age squared	9.91E+07	8086351	.01	.14***	.14***	-.09***	-.03*	.99***			
8	Home advantage	0.5	0.5	.25***	.02	.01	-.00	.02	.02	.02		
9	Relative suspension time	0	15.04	.22***	.01	.01	.01	.02	.04*	.04*	.14***	
10	Difference in number of substitutions	0	0.76	.18***	.02	.01	.06***	.07***	.02	.02	.03	.03

Note: Significance levels (one-tailed): † 10%, * 5%, ** 1%, *** 0.1%. N = 3672.

[10] A commonly given rule of thumb says that only VIFs above a value of 10 may be a reason of concern (see, Neter et al. 1989).

Table 2 shows the estimation results from the regression analysis including team fixed effects for both competing teams of a match. Seven out of 11 variables are significant in predicting the relative outcome of a soccer match, as measured by the goal difference. Based on the tenets of the resource-based view of the firm, I predicted in hypothesis 1a that team performance is positively affected by the accumulation of team-specific human capital. I find support for this relationship as the proxy variable for a team's stock of team-specific human capital, measured by the team average of prior appearances for the current team significantly increases team performance ($b = 0.012$, $p < 0.10$). Furthermore, I hypothesized the performance increments to be subject to diminishing returns due to typical learning processes (hypothesis 1b). The results are suggestive of such a concave relationship between a team's stock of team-specific human capital and team performance, as the squared term of the team-specific human capital measure is significantly negative ($b = -0.0001$, $p < 0.10$). Shared experience in working as a team seems to matter even beyond the positive impacts of general human capital.

Table 2: Team Fixed Effects Regression Results

Variable	Coefficient	
Constant	-5.3883	(11.2412)
Team-specific HC	.0123 †	(0.0082)
Team-specific HC squared	-.00008 †	(0.00006)
Heterogeneity of team-specific HC	-.0064 *	(0.0026)
Coach's team-specific HC	-.0012	(0.0018)
Team-specific HC × coach's team-specific HC	-5.41E-6	(0.00002)
Difference in general HC	.2119 †	(0.1387)
Age	.0008	(0.0023)
Age squared	-3.00E-8	(1.15E-7)
Age heterogeneity	.0001	(0.0001)
Home advantage	.7838 ***	(0.074)
Relative suspension time	-.0216 ***	(0.0024)
Difference in number of substitutions	.4238 ***	(0.049)

Note: The dependent variable is the goal difference of a match. In order to account for potential time effects, the model also includes seasonal dummies, which are not reported in the table. Standard errors in parentheses are heteroskedasticity robust standard errors clustered at the match-level. Significance tests are one-tailed. Significance levels (one-tailed): † 10%, * 5%, ** 1%, *** 0.1%. N = 3672. $R^2 = 0.26$.

The data provide strong support for hypothesis 2 ($b = -0.006$, $p < 0.05$). Seemingly, team-specific human capital must be equally distributed among the team members to achieve its full potential. This finding can be interpreted in line with Kremer (1993), who suggested that in performing conjunctive tasks, a team member's lack of certain skills cannot be compensated by other team members' superior skills. This finding together with the support for hypotheses 1a and 1b implies that, all else being equal, teams whose members are, on average, both experienced in playing for their current team and homogeneous concerning that experience are more successful simply because they are more used to playing together as a team.

Hypothesis 3, suggesting that a team coach's team-specific human capital interacts non-monotonically with his players' team-specific human capital to affect

team performance, is not supported by the data. Neither the coach's number of prior games with the current team as a measure for team-specific coaching experience nor the interaction term between this variable and the team's stock of team-specific human capital has a significant effect on team performance.

Looking at the control variables, I find a positive and statistically significant impact of the relative difference between the opposing teams' logarithmic sum of estimated player market values on team-performance ($b = 0.212$, $p < 0.10$). This result confirms the expectation that a team's performance in soccer also depends on a team's relative advantage concerning the stock of general human capital. The variable mean age and its square are not significantly correlated with team performance. A possible explanation is that a player's age is already accounted for in his estimated market value. Also, the coefficient for age heterogeneity is insignificant and does not indicate that the team composition concerning the team members' age is critical in explaining team performance. However, the integration of this control variable was necessary to rule out age heterogeneity as an alternative explanation for hypotheses 2.

The coefficient for home advantage is highly significant ($b = 0.784$, $p < 0.01$). This result is in line with Carmichael and Thomas (2005), who showed that home field factors positively influence the effectiveness of the home team. All else being equal, a team scores approximately 0.8 goals more in a home match than in an away match.

Similarly intuitive is the significantly negative coefficient for relative suspension time, controlling for numerical disadvantage due to red cards ($b = -0.022$, $p < 0.01$). A team that plays about 46 minutes with fewer fielded players than the opposing team receives on average one goal more than it scores.

Finally, a significant effect is found for the difference in the number of substitutions. As expected, there is a strong positive correlation between the difference in the number of substitutions and team performance ($b = 0.424$, $p < 0.01$). All else being equal, a team that uses one more substitution than its opponent scores approximately 0.4 more goals. However, as it is unclear whether the association is

causative or correlative, this finding does not provide any guidance to coaches regarding how to make use of their substitutions. Substitutions may allow the coach to replace temporarily bad performers or exhausted or injured players with promising prospects sitting on the bench. Conversely, it is also plausible that the leading team has an incentive to substitute an offensive player with a defender in order to hinder the opponents' attempts to catch up.

2.4 Discussion and Conclusion

In this paper, I empirically investigated whether a team's shared experience, i.e., its stock of team-specific human capital, as an intangible and unobservable resource, sustainably affects team output. I employed a large panel data set of professional soccer teams from the German *Bundesliga* as an example of highly interactive teams, and I used this sample to examine how team-specific human capital qualifies as a critical resource for achieving a competitive advantage. According to the resource-based view, such a critical resource must add value to the firm, it must be rare, it must be inimitable and it must not be substitutable by an alternative resource (Barney, 1991). Based on these tenets, I hypothesized a positive relationship between a team's stock of team-specific human capital and team performance. The empirical investigation provides support for this prediction, indicating that team members should generally be retained in the team. Furthermore, I am able to show that the relationship between team-specific human capital and team performance is not linear but concave in shape, which can be convincingly explained by learning effects.

Concerning the heterogeneity of a team's team-specific human capital, I find a clearly negative impact on team performance, indicating that team members should not only be retained in the team but should also be similarly experienced in playing for their current team. These findings support the notion of team-specific

human capital as constituting a critical resource according to the resource-based view of the firm. As an intangible resource, team-specific human capital is able to induce and, at least temporarily, sustain a competitive advantage because it is relatively safe from being imitated by competitors or substituted by another resource.

I also find that team performance in soccer depends on the relative advantage in a team's stock of general human capital. However, general human capital is freely transferable because it is valuable to all teams, whereas the value of team-specific human capital is lost when the team is changed (see Williamson, 1984).

The finding that a player's specific relationships with teammates matter implies that the loss of team-specific human capital in the case of a transfer should be accounted for in any club's investment decision regarding the engagement of new players (Clarke and Madden, 1988; Rosen and Sanderson, 2000). The failure to consider this aspect may explain the occasional observation that a soccer player turns out to be a flop after a transfer to a new team because he does not live up to expectations. Moreover, the specificity of certain employment relationships and their interdependence give rise to difficulties in evaluating investment decisions (Vrooman, 1996).

For coaches, the results are less conclusive, potentially because I did not incorporate information about general coaching ability or information about the coach's involvement in decisions regarding the engagement of new players. The latter aspect may have an impact on the coach's tenure because the more influence a coach has to chose players according to his tactical concepts, the more team-specific his relationship with the club may become. With these relationship-specific (or management-specific) investments, the coach can safeguard his position because his layoff becomes increasingly costly for the club management (see Shleifer and Vishney, 1989). The introduction of adequate proxy variables that capture the degree of the coach's general human capital as well as the specificity of his employment relationship would be a sensible extension of this study.

Whenever correlational designs are used, concerns about internal validity such as possible reverse causality may be raised. My finding that team-specific human

capital increases team performance could be spurious if continuity in the team composition was simply a consequence of successful team performance. In order to test for potential reverse causality, I regressed the team's stock of team-specific human capital on team performance, lagged one time period, using the same team fixed effects estimation approach and the same control variables as in the main model. In doing so, I find a positive (b = 0.05) but insignificant (p-value = 0.51) influence of previous team performance on specific human capital. Thus, I find no evidence for reverse causality running from team performance to specific human capital.

An alternative explanation for the results may be provided by Jovanovic's (1979) matching theory. If I assume that, in general, unproductive employments will be terminated and productive employments will be prolonged, then I must conclude that tenure should be a good indicator of productivity. Or, as Flinn (1986) put it: "The longer an employment spell continues, the more precise is the estimate of the match." I am unable to distinguish between the impact of the specificity of the relationships and the impact of the precision of the match estimate because both increase with tenure and both have a positive effect on team performance. However, the observation that team-specific human capital is positively correlated with team performance in a highly transparent production process with minimal information asymmetries concerning the players' performances and capabilities suggests that performance increments are more likely due to team-specific human capital. I argue that in soccer, precise ex ante information with which to estimate a match is publicly available. In non-sports industries, external employers have only limited access to *ex ante* information and must therefore deduce less precise estimates of the real productivities (Barron and Loewenstein, 1985; Greenwald, 1986). An employer continuously gains information regarding an employee's initially unknown performance-relevant characteristics. However, it is unrealistic to assume that this information will be transferred to a new employer if it can be kept private (Wilde, 1977; Johnson, 1978). Thus, information asymmetries between the current employer and potential external employers may be a rea-

sonable explanation of the tendency to prolong existing employments, but this argument is hardly applicable to soccer teams.

Another peculiarity of soccer that may limit the transferability of the results to other industries concerns the issue of moral hazard in teams (e.g., Holmstrom, 1982). Almost perfect monitoring in the stadium and on TV compels players to strive for excellence and impedes collusion between some of the team's players. However, in most other professional contexts, moral hazard problems are more likely to emerge because the employees' actions are less observable.

In order to explore the transferability of the results, I advocate further investigation of the relationship between the composition of team-specific human capital and team performance in other contexts involving teamwork.

2.5 Appendix A

Teams included in the sample, their respective presence in the Bundesliga within the timeframe of the data set and some descriptive statistics are shown below:

Table 3: Teams Included in the Sample

Team	Obs	Seasons
Borussia Dortmund	204	2001/02 to 2006/07
Bayern München	204	2001/02 to 2006/07
FC Schalke 04	204	2001/02 to 2006/07
Borussia Mönchengladbach	204	2001/02 to 2006/07
Hamburger SV	204	2001/02 to 2006/07
Hansa Rostock	136	2001/02 to 2004/05
1860 München	102	2001/02 to 2003/04
Werder Bremen	204	2001/02 to 2006/07
VfB Stuttgart	204	2001/02 to 2006/07
SC Freiburg	102	2001/02; 2003/04 to 2004/05
1. FC Köln	102	2001/02; 2003/04; 2005/06
Bayer Leverkusen	204	2001/02 to 2006/07
FC St. Pauli	34	2001/02
1. FC Kaiserslautern	170	2001/03 to 2005/06
Eintracht Frankfurt	102	2003/04; 2005/06 to 2006/07
VfL Bochum	136	2002/03 to 2004/05; 2006/07
MSV Duisburg	34	2005/06
Arminia Bielefeld	136	2002/03; 2004/05 to 2006/07
Hertha BSC Berlin	204	2001/02 to 2006/07
VfL Wolfsburg	204	2001/02 to 2006/07
1. FC Nürnberg	170	2001/02 to 2002/03; 2004/05 to 2006/07
Energie Cottbus	102	2001/02 to 2002/03; 2006/07
Hannover 96	170	2002/03 to 2006/07
FSV Mainz 05	102	2004/05 to 2006/07
Alemannia Aachen	34	2006/07

2.6 Appendix B

A sample calculation of the proxy variable for a team's stock of team-specific human capital is shown below:

$$\text{Mean of all fielded team members' team-specific human capital on a team-match level} = \frac{\sum_{\text{All fielded players}} (\text{player i's number of prior appearances for team})}{\text{Number of fielded players}}$$

For illustration purposes, consider the following (real) example of Borussia Dortmund on the first match day of the 2001/02 season. The fielded players (starting lineup as well as the substitute players) have the following histories with Borussia Dortmund.

Table 4: An Example for Prior Appearances

	Player	Prior appearances for Borussia Dortmund
1.	Jens Lehmann	76
2.	Christian Wörns	50
3.	Jan Derek Sörensen	10
4.	Dede	85
5.	Tomas Rosicky	16
6.	Giuseppe Reina	58
7.	Miroslav Stevic	68
8.	Jörg Heinrich	31
9.	Jan Koller	1
10.	Lars Ricken	187
11.	Marcio Amoroso	1
12.	Jürgen Kohler	170
13.	Stefan Reuter	218
14.	Evanilson	54

Note that "Prior appearances for Borussia Dortmund" only take into account the period during which the player has continuously stayed with his current team. In the event that a player had already played for the current team in the past, then changed to another team before returning to his current time, only the period following his most recent transfer is factored in. In my example, Jörg Heinrich played for Borussia Dortmund from the 1995/96 through the 1997/98 season. In the following two season, he played in Italy for AC Florence and returned to Dortmund for the 2000/01 season. According to my conceptualization, I only consider his experience with Borussia Dortmund after his transfer from Florence. Thus, on the first match day of the 2001/02 season, it is his 31st appearance in a league match with Borussia Dortmund.

These data yield the following calculations of Borussia Dortmund's mean of team-specific human capital:

$$\frac{76+50+10+85+16+58+68+31+1+187+1+170+218+54}{14} = 73.21$$

I do not weight the player-team specific human capital with the playing time on the pitch for two reasons: first, the playing times are very similar, as the number of possible substitutions is restricted to three. Second, and even more important, the team's stock of team-specific human capital would be affected by red cards, which reduces the team's sum of playing time and would therefore distort the effect of team-specific human capital.

3 How Expectations Affect Managerial Change[11]

3.1 Introduction

The objective of a manager in all sorts of organizations is to develop and deploy selected resources and capabilities in order to generate organizational rents (Amit and Shoemaker, 1993). Thereby he is generally held accountable for the performance within his area of responsibility. In case results repeatedly fall short of expectations the manager has to fear sanctions like being assigned to a less prestigious position or even being fired (e.g., Groves, Hong, McMilan, and Naughton, 1995).

The economic relevance of a dismissal and its associated contingencies is unquestioned. In their review of 30 years of research on managerial change, Kesner and Sebora (1994) even remark that "… few if any transitions at other organizational levels have as profound an effect either inside or outside the firm" (p. 357). Standard economic theory suggests that the subjacent motivation is either to increase profits or to reduce losses. For all practical purposes a replacement decision is admittedly not as easily made because respective decision makers usually face a high degree of uncertainty in terms of the post-succession effect.

Despite extensive empirical analyses no generally accepted model has emerged so far (e.g., Lieberson and O'Connor, 1972; Weiner and Mahoney, 1981; Virany, Tushman, and Romanelli, 1992; Denis and Denis, 1995; Shen and Cannella, 2002). Scholars investigating the determinants of managerial change generally agree on the critical importance of performance expectations, but the problem of

[11] A revised version of this chapter will be published in Pieper, J., Nüesch, S., and Franck, E. (forthcoming). How performance expectations affect managerial replacement decisions. Schmalenbach Business Review.

specification has only deficiently been solved so far (DellaVigna, 2009). A related drawback of many existing studies is that they are incapable of estimating deviations from expectations because they lack objective and reliable performance data that the manager can be held accountable for.

In this chapter, I attempt to address these obstacles in order to derive more valid conclusions. Using a detailed panel data set of team performance from the German *Bundesliga*, I develop a full-fledged analysis of the determinants of managerial change. In particular, I draw on Köszegi and Rabin (2006) and assume that actual performances are benchmarked relative to a rationally expected reference point. The innovative specification of performance expectations is based on supplementary data on betting odds. These prediction market prices are continuously updated and aggregate all relevant information available until shortly before the match (e.g. relative playing strength, relative coaching quality, season aspirations, momentum effects, unforeseen player injuries, etc.).

Following prospect theory, which predicts how people choose between alternatives that involve risk (Kahneman and Tversky, 1979), I hypothesize that (i) the probability of a coach dismissal increases with expectations, even after controlling for the actual performance of the team and (ii) that coaches are more likely to be fired if they fail to meet expectations, compared to peers with equal performance who meet or beat expectations. Both hypotheses are confirmed by the data.

The remainder of this chapter is structured as follows: First, I outline the basic limitations of prior studies on managerial change in general and of respective sports studies in particular. I then review the literature of relevant sports studies with contemplation of their methodological developments in more detail. In the subsequent methodological part, I describe the dependent and independent variables and derive the hypotheses, followed by the presentation of our, data, and results. I conclude with a discussion of the main findings as well as some suggestions for further research.

3.2 Conceptual Background

Despite extensive empirical research on the determinants of managerial change results remain largely contradictory. The *specification of expectations* constitutes a major obstacle in investigating managerial change. As mentioned above, decision makers face a high degree of uncertainty when they terminate a managerial employment. Hence, research on the determinants of managerial change is informed by theory on individual risk-taking behavior (Libby and Fishburn, 1977; Lopes, 1987; Sitkin and Pablo, 1992) and by theory integrating individual risk-taking behavior with decision-making processes in organizations (Staw, Sandelands, and Dutton, 1981; Milliken and Lant, 1991; Ocasio, 1995). Most prominently, Kahneman and Tversky (1979) formulate the importance of expectations in their prospect theory and predict how people choose between alternatives that involve risk. Contingent on certain goals the alternatives are evaluated relative to a reference point with lower outcomes as losses and larger outcomes as gains. According to their proposed s-shaped value function, people generally show a significantly greater aversion to losses than appreciation of gains.

In the literature there is general agreement that expectations matter and empirical studies on risk taking in business situations support the predictions of prospect theory. Results confirm an increase in risk taking below the reference point (Lant and Montgomery, 1987; Wehrung, 1989) and managers report taking fewer risks when performance exceeds their goals (Singh, 1986; March and Shapira, 1987). However, existing approaches are unable to completely resolve ambiguity. The determination of the reference point is still a key issue in the literature on reference point-driven behavior (see DellaVigna, 2009 for a comprehensive review).

Köszegi and Rabin (2006) offer a solution to mutually inconsistent predictions of different plausible specifications of the reference point (e.g., status quo, lagged status quo, the mean of the chosen lottery) in order to simplify the application of the theory. They assume that in most situations people have some ability to predict their own environment and behavior. Thus, they suggest to model the reference point as a person's rational expectations held in the recent past about outcomes and consistent with optimal behavior given expectations.

A second obstacle in this context is the *measurement of performance*. The more complex the structure of a firm, the more difficult it is to isolate a single person's impact on performance (Wright, McMahan, and McWilliams, 1994). As managerial change is typically accompanied by simultaneous changes, it is difficult to assess the performance impacts attributable to individual managerial quality. Also, the measurement of performance may be complicated because the interests of the firm's decision makers are not necessarily aligned but may, on the contrary, diverge substantially. The intransparency of internal personnel decisions further restricts the investigation of managerial change. Firms usually have no particular interest in publicly disclosing information about their promotion and demotion mechanisms (Koning, 2003). The fact that most performance measures are prone to misinterpretation may also increase organizational inertia or resistance to change (Hirschman, 1970; Milliken and Lant, 1991). Similarly, decision makers facing decisions with a high degree of uncertainty tend to simplify evaluation by transforming a continuous performance measure into a discrete measure of subjective success or failure (March, 1988).

Moreover, organizations do not necessarily change managers whenever their recent performance negatively deviates from rational expectations. The probability of managerial change is also contingent on the *opportunity to change*, which constitutes a third difficulty for empirical testing. Frequently, predetermined or at least anticipatable opportunities arise to change a poorly performing management. In these cases dysfunctional productivity effects following the succession can be mitigated by adequate preparation. Typical events may be an election defeat in a political party, the retirement at a certain age in a business or a public organization, or the end of a disappointing season in a sports club. However, managerial change can also be observed at less convenient times, not allowing for detailed preplanning of the transition. Assuming that managers do not voluntarily withdraw, explanations for such short-termed dismissals may be inter alia strong underperformance, personal misconduct, or external factors, such as stakeholder pressure or takeover attempts. The timely limited use of risk-reducing provisions even increases the risk involved with respective decisions to dismiss a manager.

These obstacles give rise to a strong tradition of research based on team sports data within the empirical literature (see Audas, Dobson, and Goddard, 2002 for a review). The position in sports analogous to a manager in a firm is a head coach.

In order to address the research question of how expectations affect managerial change, the sport context offers the unique opportunity to make use of betting odds in order to account for continuously updated expectations about match outcomes. These prediction market prices incorporate all relevant information available until shortly before the match (e.g., relative playing strength, relative coaching quality, season aspirations, momentum effects, unforeseen player injuries).

Moreover, accurate data on measures of individual and team performance are readily observable because the production process of a soccer match takes place in a highly transparent and controlled field environment. One might object that team outcomes are objectively reflected in match results but that the underlying processes that determine team productivity are relatively opaque. Of course, the coach's ability to control match outcomes is constrained by chronic unpredictability surrounding the fitness, performance, and cooperation of the players. However, unlike elsewhere is the business world, all coaches are equally affected by this uncertainty. The club's and the coach's interests are almost perfectly aligned because the coach's objective is precisely defined: He is in charge of developing, motivating, and selecting players from the roster in order to accumulate as many points as possible. Individually, each match is a zero-sum game, and the inevitability of failure for some teams is inherent in any league where the only outcomes that eventually count are team rankings. The mechanisms of promotion and relegation also create substantial incentives to be successful.

Usually, the principal-agent-relationship is characterized by larger information asymmetries with the principal being the disadvantaged party because the agent enjoys some discretion when performing his job. Since the principal can only control the agent at some considerable costs, the agent is tempted to behave opportunistically (Jensen and Meckling, 1976). However, due to almost perfect monitoring mechanisms, the occurrence of coaches showing moral hazard behavior is unlikely in professional sports. Any form of misbehavior becomes immediately obvious and can be sanctioned accordingly.

Compared to other managerial employments, turnover rates of coaches are high in team sports, which facilitates empirical investigations.[12] Changes in the soccer team's coaching position are perfectly documented. Due to a large public interest in the clubs' personnel decision and almost continuous media coverage there is hardly any other context imaginable that allows for a comparably precise distinction between voluntary and involuntary dismissals as well as a profound investigation of the underlying reasons.

3.3 Related Literature

There are a number of studies analyzing the determinants of managerial change in various team sports. Scully (1994), for example, examines the relationship between managerial efficiency and managerial survival rates using season-level data from basketball, (American) football and baseball. In different maximum-likelihood Weibull regression models managerial tenure is found to be linked to managerial efficiency, i.e., the coach's ability to extract the largest win percentage from a given pool of playing talent.

Fitzel and D'Itri (1997) use season-level data from US college basketball teams from seven seasons to estimate the probability of voluntary and involuntary coach dismissal. A data envelopment analysis (DEA) model measures the efficiency of a given manager relative to the efficiency of all managers in the industry. They find out that managerial efficiency and the team's pool of playing talent initially have a significantly negative effect on coaching tenure. However, the effect disappears when the team's win ratio is entered into the regression. For coaching experience no effect is found in either model.

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[12] Frick (1998) found out that in the German Bundesliga a head coach's mean tenure amounts to 12.5 months. Whereas, coaches who take their position at the beginning of a new season are in charge for 15.9 months on average, their colleagues, who take over a team within the season, only stay for 7.4 months on average.

Audas, Dobson, and Goddard (1999) take further covariates into account and focus on the link between very short-term fluctuations in team performance and managerial hazard rates using match-level data from the English Premier League over a period of 25 seasons. Employing a Cox proportional hazard model, the authors find out that involuntary termination is highly contingent on team performance in the most recent matches. The nine preceding match results all exert a statistically significant impact on the hazard, as does the win ratio for the entire current spell. Whether the team's current position is higher or lower than its position when the coach took charge is also a crucial factor. The hazard rate is insensitive to coaching experience but increases with the coach's age.

Salomo and Teichmann (2000) choose a logistic regression model to investigate the probability of involuntary within-season coaching dismissal, using match-level data from 20 seasons of the German *Bundesliga*. The central covariates of their analysis are concerned with the performance of the entire season and of the most recent matches. Both are further categorized into objective and subjective performance, whereas the latter is based on the objectives proclaimed in the sport press before the season starts. Especially the performance development within the short term in relation to objectives set at the beginning of the season is found to have a significant effect on the decision to replace the coach. The intensity of local media coverage and a recent turnover of the board president position are two other variable that significantly contribute to an increase of the probability of a coach dismissal.

In a study by Hope (2003) operations research techniques are used to estimate the optimal time to dismiss a coach in English Premiership and Nationwide League football, based on season-level data of six seasons. Unfortunately, derived hiring and firing decisions are only based on coach's winning percentage and thus unlikely to be optimal. Implicitly, the model is only calibrated against the average club.

Employing a discrete-time logistic framework, Bachan, Reilly, and Witt (2005) make use of English football match-level data from (only) one season to investigate involuntary termination of coaches' employment status. The authors model the hazard based on the spell at risk, rather than the individual. In accordance with

Audas, Dobson, and Goddard's (1999) findings, deviations from the league position at the start of the spell are found to be the most important determinant of a coach's exit. Individual human capital covariates (i.e., age, experience, length of service, ethnicity) are found to be unimportant in explaining coach dismissals. Managers whose teams are threatened by relegation are significantly more likely to be sacked than their colleagues of more successful teams.

Audas, Goddard, and Rowe (2006) use match-level data from the National Hockey League (NHL) to model employment durations of coaches with a logit specification. A statistically significant link between individual match results and the coaching hazard is found for up to 15 matches prior to the current match. The direct impact of match results remains unaffected even if expected match outcomes, obtained from an ordered probit match results model, are taken into account. However, expectations appear not to be irrelevant as the hazard is sensitive to the team's current position in the standings relative to the position predicted by a panel of experts pre-season. The probability of an involuntary separation decreases with the age of the coach and increases if the coach was previously employed as a player by his current team.

Tena and Forrest (2007) construct a probit model to account for within-season dismissal of coaches in the Spanish Premier League based on match-level data of three seasons. Their results indicate that dismissals typically occurred at clubs, which were underperforming relative to the size of their budget. Being in a relegation position in the standings, rather than a run of poor results per se, turns out to be a key trigger of deciding to sack the coach.

Barros, Frick, and Passos (2009) use a season-level data set from 22 seasons of the German *Bundesliga*, including information on the salaries of coaches. Employing a Cox proportional hazard model, they show that higher paid coaches have no longer survival time compared to more poorly paid managers. Success on the field is the major determinant of a coach's job tenure. The relative wage bill, reflecting the available playing talent, has a positive effect on the hazard. Coaches of more expensive teams might be more vulnerable because an underperformance increases the probability of a dismissal.

Frick, Barros, and Prinz (2010) rely on the same data set but use a mixed logit model to analyze the dismissal of coaches. In contrast to Audas et al. (1999), they find no clear differences in the determinants voluntary and involuntary separations. Both the probability of involuntary dismissal and voluntary resignation are positively related to the team's most recent performance and the remuneration of the input factors, i.e., the coach's and the players' salaries. A coach's career win percentage and the number of relative points won in the current season are to found to decrease the probability of a coach to loose his job.

3.4 Hypotheses

The empirical evidence from sport studies consistently suggests that performance expectations are important drivers of the decision to terminate a coach's appointment. For one thing the relevance of expectations is explicitly addressed in prior studies, for another thing it is only implicitly presumed. In either way, the specification of expectations constitutes a major obstacle for deriving universally valid conclusions. Different measures of reference are the relative quality of players and coaches of the opposing teams (Scully, 1994; Fitzel and D'Itri, 1997; Tena and Forrest, 2007; Frick, Barros, and Passos, 2009; Frick, Barros, and Prinz, 2010), the team's recent performance (Audas, Dobson, and Goddard, 1999; Salomo and Teichmann, 2000; Audas, Goddard, and Rowe, 2006), the team's league standing predicted by a panel of experts pre-season (Audas, Goddard, Rowe, 2006), the team's league standing when the coach took charge (Audas, Dobson, and Goddard, 1999; Bachan, Reilly, and Witt, 2005), or the self-defined target standing in the league as articulated in the sport press before season start (Salomo and Teichmann, 2000).

However, all these approaches either ignore or do not appropriately reflect that the expectation of a match outcome is contingent on the relative playing strength of both opposing teams. In prior studies scholars simplify evaluation by using a discrete measure of home wins, away wins, and draws, regardless of the opposi-

tion team in the respective match. Alternatively, proxy variables for relative playing strength are only based on broad season-level data, but not on match-level data.

We, in contrast, build on the approach of Köszegi and Rabin (2006), who suggest to model the reference point as a person's rational expectations held in the recent past about outcomes and consistent with optimal behavior given expectations. Specifically, I assume that a club's decision makers continuously update the performance expectations for which they hold their coaches accountable. As the mere consideration of a team's recent performances or its expected league standing cannot account for this updating process, I make use of betting odds on match outcomes. Bookmakers have large financial incentives to appropriately assess match outcome probabilities. The betting market provides predictions that aggregate all relevant information on a specific match and are continuously updated until shortly before kickoff. Playing strength, general coaching quality, season aspirations, momentum effects, unforeseen player injuries, and so forth are simultaneously incorporated for both opposing teams in the respective match.

Evidently, higher expectations are more difficult for the coach to meet. I therefore predict that, regardless of the actual performance, the dismissal likelihood increases with expectations.

Hypothesis 1:

The higher the expectations, the more likely is coaches to be fired, controlling for the performance of the team.

According to Kahneman and Tversky's (1979) prospect theory, alternatives are evaluated relative to a reference point with lower outcomes as losses and larger outcomes as gains. In case of losses, the theory predicts that decision makers are more likely to show risk seeking behavior. Applied to professional football, I expect the probability of a coach dismissal to increase with upset losses. Hoping for

a positive shock effect, the decision makers become more willing to accept the risk associated with the employment termination.

Hypothesis 2:

Coaches who fail to meet expectations are more likely to be fired than peers who meet or beat expectations, controlling for the team performance.

3.5 Methodology

3.5.1 Dependent Variable

I attempt to explain managerial change in a given match-day. The dependent variable is the binary variable Y_{it}, where $Y_{it} = 1$ if the coach of team i is dismissed in match-day t ($Y_{it} = 0$ otherwise).

3.5.2 Independent Variables

The bookmaker's (fixed) odds provide a good predictor of the likelihood of a certain match outcome (Wolfers and Zitzewitz, 2006). Forrest, Goddard, and Simmons (2005) show that bookmaker odds are more effective in predicting match outcomes than a benchmark statistical model that incorporates a large number of quantifiable variables.

For each possible match outcome $k \in \{HomeWin, Draw, AwayWin\}$ the bookmaker posts decimal odds o_{itk} (e.g., 2.0) that represent the payout ratios for a winning bet of the match outcome k of team i in match t. To get the bookmaker market's forecast of an outcome, I transform the odds o_{itk} into implicit probabilities

p_{itk}. The implicit probability is simply the inverse of the odds adjusted for the margin included in the odds. Formally:

$$p_{itk} = \frac{1}{o_{itk}} \frac{1}{\sum_{i} o_{itk}}.$$

I use the p_{itk} as a predictor of the probability of the underlying match outcome occurring. In order to derive the expected points I calculate:

$$Expected\ Points_{it} = p_{it,\ win} * 3 + p_{it,\ draw} * 1$$

The variable *Expected Points* is aggregated over a varying number of previous matches, namely three, six, and nine matches, and constitutes an adequate proxy variable of the expectations a coach faces.

In order to test hypothesis 2, I need a measure of underperformance (i.e., the actual team performance falls short of expectations). To do so, I compare the actual team performance with the expected performance according to the bookmaker odds. If the actual performance is higher than the expected performance, the coach is able to beat expectations. If the realized number of points of the previous three, six, and nine matches is lower than the expected number of points, the coach fails to meet expectations. Thus, the variable $Underperformance_{it}$ equals 1 if the difference between actual minus expected number of points is negative (0 if positive). Here again, the variable may include the previous three, six, and nine matches.

As already mentioned in the hypotheses, I control for the performance of the team as covariate. To do so, I include for the team's current rank in the league. The league standing variable $Rank_{it}$ varies between 1 (best team) to 18 (worst team). Following Audas, Dobson, and Goddard (2002), Bachan, Reilly, and Witt (2005), and Tena and Forrest (2007), I also consider the critical importance of avoiding relegation. A club might be more willing to dismiss a coach if it is in the relegation ranks because it becomes more risk loving and hopes to use an initial boost in performance of a new coach to draw clear of danger. I therefore include a

control variable *Relegation* equaling 1 if the team's league position is in the relegation ranks 16 to 18 (0 if otherwise).

Moreover, I control for unobservable, but time-constant team heterogeneity. Time-constant team heterogeneity may be correlated with both performance expectations and managerial change. Finally, I account for common time trends by seasonal dummies.

3.5.3 Data

In order to test the hypotheses, I use a large panel of match-level data of teams appearing in the highest German soccer league, the *Bundesliga*, from the 2001/02 season to the 2005/06 season. In each season each of the league's 18 teams plays each other team in one home and one away match, resulting in 34 matches per team and season and a total of 612 team-match observations per season. Since the data set covers five seasons, I dispose of 3060 team-match observations. I supplement the performance data by corresponding betting odds from the bookmaking company *Oddset*. Due to the relegation of the three lowest-ranked teams and the promotion of the three highest-ranked teams of the second *Bundesliga* at the end of the season, the study sample comprises 24 teams. Within the sample period I observed 46 involuntary and 19 voluntary coaching dismissals. The distinction between voluntary and involuntary employment terminations was made based on extensive content analysis of press articles using the *LexisNexis* database and webpages using Google searches. Table 5 illustrates the descriptive statistics of the dependent as well as the explanatory variables.

Table 5: Variables, Descriptive Statistics, and Pearson Correlation Coefficients

Variable	Mean	SD	1	2	3	4	5	6	7	8	9
1 Involuntary Dismissal	0.02	0.12	1.00								
2 Expected points previous three matches	3.88	1.14	0.01	1.00							
3 Expected points previous six matches	7.47	2.46	0.01	0.90	1.00						
4 Expected points previous nine matches	10.80	3.98	0.02	0.83	0.96	1.00					
5 Underperformance previous three matches	0.48	0.50	0.07	-0.02	-0.01	0.00	1.00				
6 Underperformance previous six matches	0.46	0.50	0.07	-0.07	-0.05	-0.04	0.55	1.00			
7 Underperformance previous nine matches	0.44	0.50	0.08	-0.13	-0.11	-0.09	0.47	0.69	1.00		
8 Rank	9.48	5.19	0.09	-0.54	-0.52	-0.50	0.26	0.36	0.42	1.00	
9 Relegation status	0.17	0.37	0.10	-0.31	-0.30	-0.28	0.18	0.25	0.29	0.65	1.00

Note: N = 3060

Due to obvious reasons, there is substantial multicollinearity between the expected number of points in the previous three, six, and nine matches as well as between the variables $Underperformance_{it}$ in the previous three, six, and nine matches. I therefore include only one variable at a time and estimate three different specifications to test the hypotheses.

3.5.4 Analysis and Results

We estimate the influence of expectations on the probability of a coaching dismissal with a linear probability model (LPM). I prefer LPM over probit or logit models for two reasons. First, unlike logit and probit estimates, the consistency of LPM estimates do not crucially rely on the normality and homoskedasticity of the error term. Second, estimated effects in the LPM model can be interpreted directly as marginal effects, whereas the marginal effects in logit and probit models de-

pend on all other covariates including the fixed effects. Table 6 presents the marginal effects and the standard errors. The standard errors are White heteroskedasticity robust and clustered at the team level to take potential serial correlation of the error terms of team observations into account.

Table 6: The Effect of Expectations on Involuntary Coaching Dismissals

Explanatory variables	**1**	**2**	**3**
Expected points previous three games	0.008 ***		
	(0.001)		
Expected points previous six games		0.004 ***	
		(0.001)	
Expected points previous nine games			0.003 ***
			(0.001)
Rank	0.002 ***	0.002 ***	0.003 ***
	(0.001)	(0.001)	(0.001)
Relegation status	0.025 **	0.024 **	0.024 **
	(0.011)	(0.011)	(0.011)
Team fixed effects	yes	yes	yes
Season fixed effects	yes	yes	yes
R^2 (within)	0.02	0.02	0.02
Observations	3060	3060	3060

Note: Table 6 shows the estimates of Linear Probability Model (LPM) of being fired. White heteroskedasticity robust standard errors clustered at the team level in parantheses. Significance levels (two-tailed): * 10%, ** 5%, *** 1%.

Table 6 shows that high expectations generally increase the probability of being fired. The number of expected points in the last three, six, and nine matches all significantly impact involuntary coaching dismissals. The point estimates may appear small. However, in comparison to a base line probability of 1.5% of being fired after any random game, the point estimates are quite substantial.

The effects of the control variables are consistent with the predictions. Coaches are more likely to be fired if their team is low in the current league table (high rank). If the team is in the relegation zone, the probability of being fired additionally increases in a statistically significant way. Thus, I find hypothesis 1 confirmed in the data. The higher the expectations, the more likely the coach will be fired, controlling for the current league standing and the relegation status of the team.

Table 7: The Effect of Underperformance on Involuntary Coaching Dismissals

Explanatory variables	**1**	**2**	**3**
Underperformance previous three games	0.011 ***		
	(0.003)		
Underperformance previous six games		0.011 ***	
		(0.004)	
Underperformance previous nine games			0.012 ***
			(0.005)
Rank	0.0015 **	0.0014 **	0.0013 **
	(0.0007)	(0.0006)	(0.0006)
Relegation status	0.025 **	0.025 **	0.0249 **
	(0.011)	(0.011)	(0.011)
Team fixed effects	yes	yes	yes
Seasonal fixed effects	yes	yes	yes
R^2 (within)	0.01	0.01	0.01
Observations	3060	3060	3060

Note: Table 7 shows the estimates of Linear Probability Model (LPM) of being fired. White heteroskedasticity robust standard errors clustered at the team level in parantheses. Significance levels (two-tailed): * 10%, ** 5%, *** 1%.

Table 7 shows the results of a model that directly tests the influence of underperformance in the previous three, six, and nine matches on the probability of an employment termination in the coaching position. I find that coaches who fall short of expectations are more likely to be fired than peers with similar perfor-

mance records facing lower expectations. This finding is consistent for the last three, six, and nine matches as selected periods of reference. Thus, hypothesis 2 can be confirmed. Beyond negative deviations from performance expectations, the league rank and the relegation status have a significantly positive effect on the probability of involuntary dismissals.

3.6 Discussion and Conclusion

Scholars investigating the determinants of managerial change generally agree on the critical importance of performance expectations, but the problem of specification has only deficiently been solved so far (DellaVigna, 2009). A related drawback of many existing studies is that they are incapable of estimating deviations from expectations because they lack objective and reliable performance data that the manager can be held accountable for.

In this chapter, I have made an attempt address these obstacles in order to derive more valid conclusions on the antecedents of managerial change. Using a detailed panel data set of team performance from the German *Bundesliga* and supplementary data on betting odds I find that (i) the probability of a coach dismissal increases with expectations, even after controlling for the performance of the team and that (ii) coaches are more likely to be fired if they fail to meet expectations, compared to peers with equal performance who meet expectations. Thus, expectations affect managerial change even beyond the actual performance.

The results are largely consistent with Salomo and Teichmann's (2000) finding, that the performance development within the short term in relation to objectives set at the beginning of the season has a significant effect on the decision to replace the coach. Equally, the results are in line with Audas, Goddards, and Rowe (2006), who also confirm the impact of expectations on managerial change. Investigating NHL hockey teams, they find that probability of a coach dismissal is sensitive to the team's current league standing relative to the position predicted by a panel of experts pre-season. However, the results are more conclusive for two reasons.

First, I employ match-level data instead of seasonal data. Second, the innovative specification of performance expectations is based on prediction market prices, which are continuously updated and aggregate all relevant information available until shortly before the match for both opposing teams. We, thus, believe to make a unique contribution to the empirical literature on managerial change.

What are the practical recommendations that can be derived from my research? Contrary to non-sport businesses the typical consequences of a soccer team's ongoing inadequate performance are not the loss of customers and a subsequent strategic reorientation. Soccer clubs usually retain a highly loyal fan base who do not consider to abandon their support or transfer their allegiances elsewhere even in case of relegation. Due to this substantial goodwill clubs usually remain viable and manage to overcome acute financial duress. The flipside of this loyalty is that the hope for a positive shock effect of a change in the coaching position tends to generate pressures for a coach dismissal decision. In a highly competitive labor market with only 18 coaching positions in the German *Bundesliga* available at a time, every coach in charge is perfectly aware of this threat as well as its associated negative signal for future engagements. For coaches in the *Bundesliga* it may, thus, pay to sign with a less ambitious team as the expectations of fans and club management are likely to be lower which, in turn, increases the stakeholders' readiness to accept a poor performance over a couple of weeks.

Simultaneously, however, coaches can easily work for different clubs because the required human capital is largely general, i.e., transferable and productively employable in multiple contexts. This is mainly due to the rigid technology associated with the "production process" of a soccer match and the similar organizational structure of the clubs (Audas, Dobson, and Goddard, 1999). As a consequence, a coach will be more likely to accept the higher probability of being dismissed in more ambitious club the more he trusts in finding an adequate future engagement after his dismissal. Elsewhere in the business world organizational structures of competitive firms are more heterogeneous. This creates more internal opportunities for upward, downward, and lateral mobility contingent on the manager's performance. It is more likely that the same individual can be assigned to another function within the same organization.

Future research should expand my approach by including matches other than *Bundesliga* ones, i.e., national and international cup matches. I argue that the coach's job tenure should depend on all his team's performances throughout his spell, except for friendly matches. In order to validate the generalizability of the findings, my approach should be applied to other leagues and other teams sports.

4 Motives for Social Identity Processes in Organizations

4.1 Introduction

"What do you do for a living?" This question is very common in Western societies to start a conversation with new acquaintances because the choice of work seems to effectively reveal characteristic information about a person. The contemporary workplace is now to figure integrally in the evaluation of self and others. Success and failure at work play an increasingly constitutive role in the formation of identity, whether blue or white collar worker, negative outlier or high flyer (Thatcher and Zhu, 2006).

Simultaneously, organizations reduce hierarchical structures and increasingly rely on (self-managed) teams to sustain business success (Parker, 1993; Smith, 1997; Rock and Pratt, 2002). In consequence of the competitive requirement to concert individual activities, employees are not necessarily driven by personal considerations only. Employees can hardly be seen as independent entities because their individual motivation is largely derived from and adapted to the needs, goals, expectations, and rewards of the respective team or organization (Ellemers, De Gilder, and Haslam, 2004). In traditional psychological research on work motivation, however, individuals are implicitly assumed to be separate, independent entities (e.g., Maslow, 1943; Vroom, 1964; Locke and Latham, 1990). Economists similarly neglect to systematically take collective goals or joint concerns into account. They are eager to construct monetary incentive schemes, which as a sole motivator to align interests, are evidently subject to inefficiencies (see Gibbons, 1998; Prendergast, 1999 for reviews).

Therefore, I strongly agree with other scholars, who argue that scientific attention on the underlying motivations for work-related behavior in teams does not reflect the transformation of contemporary work situations appropriately (Ambrose and Kulik, 1999; Erez, Kleinbeck, and Thierry, 2001, Ellemers et al., 2004).

Social identity theory, originally introduced by Tajfel and Turner (1979), focuses on intra- and inter-group relations and is well suited for the investigation of social group behavior in organizational settings because organizations are internally structured groups, which are located in complex networks of inter-group relations that are characterized by power, status, and prestige differentials. The theory has been employed to address questions organizations are increasingly confronted with, such as how employees align individual and group interests so that they collectively engage in activities that benefit their group or how different organizational subunits interact in a collaborative way. The answers proposed by prior studies are only of limited explanatory power because of their too narrow focus of on the human motive to affiliate with groups that are distinctive and positively valued in order to enhance self-esteem (Tajfel, 1978).

The largely inconsistent and unreliable empirical evidence on this so-called self-esteem hypothesis (e.g., Abrams and Hogg, 1988; Hogg and Abrams, 1990, 1993; Rubin and Hewstone, 1998) lead Hogg and colleagues (Hogg and Abrams, 1993; Hogg and Mullin, 1999; Hogg and Terry, 2000) to propose an extended framework for social identity processes that incorporates the need for uncertainty reduction as a second fundamental motive for social identification. In their words, “in addition to being motivated by self-enhancement, social identity processes are also motivated by a need to reduce subjective uncertainty about one's perceptions, attitudes, feelings, and behaviors and, ultimately, one's self-concept and place within the social world” (Hogg and Terry, 2000, p. 124). While Hogg and Terry’s approach is fruitful in extending the knowledge about social identity processes, it

has not yet received its due attention by most organizational researchers.[13]

In this chapter I attempt to extend the framework by Hogg and Terry (2000) who remain rather vague about the relationship between the need for self-esteem and the need for uncertainty reduction and consider both to be "probably independent motivations for social identity processes", while they also acknowledge that "uncertainty reduction may be more fundamentally adaptive because it constructs a self-concept that defines who we are and prescribes what we should perceive, think, feel, and do" (p. 124). Building on this view, I argue that individuals more fundamentally strive to reduce uncertainty and that the pursuit of self-esteem is related to, or even contingent on, self-certainty. Contrary to scholars with a compliant notion, I am the first to provide a substantiated and comprehensive discussion on the relationship between both motives. In particular, I incorporate significant theoretical developments from more recent, predominately psychological research on the need to reduce uncertainty about one's social identity. I show that both motives differ substantially in terms of their conditions for activation and their motivational consequences.

The second contribution resides in applying the extended theoretical framework to specific contextual factors in organization design that are most promising to benefit from a deeper understanding of the relationship between the underlying motives of social identity processes. For instance, recent empirical findings in the area of team diversity by Joshi and Roh (2009) strengthen the need to rethink social identity processes. In their meta-analysis of team diversity related studies, the authors point out that "current applications of social identity theory […] in diversity research are insufficient for explaining these findings" (p. 620). Specifically, I illustrate the relevance of my approach to reconcile opposing findings on the performance effect of team-level diversity. In addition, I (i) explain when relative-pay schemes tend to improve or decrease team productivity, (ii) make predictions

[13] A keyword search on "self categorization" in EBSCOhost on July 30, 2010 produced four (two) hits in *AMR* (*AMJ*) since the appearance of Hogg and Terry's work in 2000. Out of these, only two mention (one merely in a footnote) the motive of uncertainty reduction for self-categorization processes, without pursuing it further.

about the differing social identity processes in open and closed internal labor markets, and (iii) make predictions about the ease of tacit knowledge integration in firms.

In order to help frame future research directions in the study of social identity processes and social behavior in organizational settings, I derive a range of testable propositions. Also, I point out concrete research areas that are most promising to benefit from an application of my approach.

In the following section, I aim to familiarize the reader with the basic concepts of social identity theory and their development.

4.2 Social Identity Theory

Social identity theory, introduced by Tajfel and Turner (1979), is a diffuse but interrelated collection of social psychological theories concerned with when and why individuals identify with, and behave as part of, social groups, adopting shared attitudes. It is extensively employed as an explanatory tool in social sciences.

Social identity theory presumes that individuals rely on belief systems about the nature and the structure of the relations between groups in their social environment. Identity is understood as a multifaceted construct: individuals typically develop a repertoire of personal and social identities. In social contexts in which a personal identity is salient, individuals will relate to others as independent entities in an interpersonal manner, contingent on their idiosyncratic characteristics and preferences. The interaction is shaped by the underlying interpersonal relationship (e.g., a friendship or a contract between two economic actors). In contexts in which social identities are salient, individuals primarily conceive themselves and others in terms of particular group memberships. Social identities represent the

subjective perception of specific groups, associated with normative rights, obligations and sanctions as well as the emotional value attached to the group membership. Interactions between groups of individuals are then not affected by the personal relationships between the individuals involved (e.g., a soldier in a battlefield or a soccer fan in the stadium).

Social identity theory further attempts to predict whether people are likely to define themselves and others as individuals or as members of a group and how these perceptions interpret and organize interpersonal and inter-group behavior by providing adaptive guidance in the social environment (Markus and Wurf, 1987; Shamir, 1992; Haslam, Postmes, and Ellemers, 2003). Generally, the application of a social category is more likely when the longevity of group memberships is high and the group boundary permeability is low, respectively (Ellemers, 1993). In social contexts in which group memberships are highly variable over time personal identities tend to be more salient than social identities (e.g., through a system of job rotation). Similarly, social identities are less cognitively accessible when individual characteristics are more significant to the conception of the situation (e.g. a firm's promotion system, which is merely based on individual merit).

According to social identity theory, the core human need for self-esteem motivates individuals to affiliate with groups that are distinctive and positively valued (Tajfel, 1978). Tajfel assumed that it is through social comparison between the in-group and contextually salient out-groups that individuals achieve an understanding of the relative status and value of their in-group. The characteristics of a group achieve most of their significance in relation to perceived differences from the out-group and the corresponding value connotations (Tajfel, 1978). Thus, social comparison depicts the means, which allows for an assessment of the in-group's social status. Given the notion that identities are relational and comparative, perceived group distinctiveness can change with the comparison situation. For example, when psychology students were asked to compare themselves to art students, they viewed intelligence-related attributes as characteristic of their group, but in comparison to physics students, they considered creativity-related attributes as

more characteristic of their group (Spears, Doosje, and Ellemers, 1997; Haslam and Ellemers, 2005).

Self-categorization theory, which constitutes a powerful elaboration of social identity theory, specifies more thoroughly how social categorization depersonalizes the perception of self and others (Turner, 1985; Turner, Hogg, Oakes, Reicher, and Wetherell, 1987). It is important to note that social identity and self-categorization theory are, in fact, different (Turner, 1999).

Social identity theory was developed to explain a range of problems in inter-group relations whereas self-categorization theory shows how uniform behavior can result from the internalization of consensual categorical attributes by in-group members (Turner et al., 1987). Self-categorization theory clearly complements the early ideas of social identity theory because it details the cognitive processes that generate social identity phenomena. Social categorization of self refers to a transformation in self-concept and the basis of perception of others. In the process of depersonalization individuals cognitively abstract from their own idiosyncrasies and assimilate self to the contextually relevant in-group prototype. They perceive representative group characteristics are increasingly perceived as self-descriptive and vicariously partake in the success and status of the group. The degree of depersonalization may vary across different social groups and situations.

Depersonalization, as the basic process underlying group phenomena, does not have the negative connotations of "deindividuation" or "dehumanization". The adaption to prototypical beliefs, attitudes, feelings, and behavior aligns the in-group members' self-concepts, eventually producing, for instance, shared norms, cohesion, cooperation, and stereotyping.

Generally, the process of social categorization can be explained by two intuitive mechanisms. The first refers to the limited information processing capability of the human cognitive system. Social categories reduce the informational complexity of the social environment and provide a systematic means for defining and classifying individuals based on a polar distinction between in-group and out-group. In a cognitive segmentation and ordering process perceived similarities of

the target group members are accentuated and abstracted from the members' noisy individual characteristics (Turner, 1985). According to the principle of metacontrast, individuals tend to maximize the ratio of inter-group differences to intra-group differences, even at the expense of absolute in-group gain (Tajfel, Billig, Bundy, and Flament, 1971). The cognitive representations of social groups are often based on exemplary members who best embody the group or on abstract ideal types (Hogg and Terry, 2000). The benefits of social categorization, such as saved cognitive resources and an increased information processing speed, typically overcompensate the costs of such assignments' reduced reliability (Hamilton, 1981).

The second, related mechanism refers to selective loyalties. Each group requires its members' attention and support but individual capacities to affiliate with different social groups are limited. Thus, the claims associated with selected group memberships must be prioritized according to their meaning to the individual. This hierarchical differentiation of social categories provides structure for an individual's life. The basis for prioritizing both current and potential, future-oriented memberships are the individual's opportunity costs of alternative memberships and/or reduced individuality due to the associated process of depersonalization.

Empirical evidence has shown that social categorization can lead to strong in-group favoritism (Brewer, 2000; Hewstone, Rubin, and Willis, 2002). Group members are prone to consider their own group as superior to other groups, even when there are few or no obvious extrinsic causes for this bias. Some studies show that the mere perception of belonging to two distinct groups is sufficient to elicit discriminatory responses against the out-group. Such biased inter-group evaluations can be understood as a result of the theory's hypothesized need for self-esteem via positive distinctiveness (Brown, 2000).

4.3 The Uncertainty Reduction Hypothesis

The assumed core motivation for self-esteem implies that low self-esteem motivates social identity processes like social identification and inter-group behavior, which are most promising to be self-esteem enhancing (Abrams and Hogg, 1988). However, research on the self-esteem hypothesis reveals inconsistent and unreliable findings, indicating some need for conceptual improvements (e.g., Abrams and Hogg, 1988; Hogg and Abrams, 1990, 1993; Rubin and Hewstone, 1998). The more recent focus on social categorization processes, in particular, has initiated a discussion on another core human motivation for social identity beside the need for self-esteem. This elaboration can be subsumed under the term *uncertainty reduction hypothesis*. Its basic assumption is that individuals attempt to gain certainty about their place within the social world (Hogg and Abrams, 1993; Hogg and Mullin, 1999; Hogg and Terry, 2000). The hypothesis implicitly revisits Festinger's (1954) original belief that there is a "motivation to know that one's opinions are correct and to know precisely what one is and is not capable of doing" (p. 217).

Obviously, the distinction between certainty and uncertainty is not categorical. Additionally, uncertainty may vary in terms of its impact, ranging from largely inconsequential questions, such as "Will it rain tonight?" to deeply troubling questions, such as "Will I lose my job?" In the psychological literature, there seems to be a consensus that individual tolerance for uncertainty is no stable personality trait but more of a cognitive and/or emotional orientation, which is responsive to and shaped by past experiences and social contexts (Furnham, 1995).[14] Thus, tolerance for uncertainty does not only vary across individuals. Also intra-individually, the reaction to uncertainty is not necessarily continuous and stable. De facto, many employees actively avoid uncertainty, others simply tolerate it,

[14] Uncertainty should be distinguished from the related but distinct concept of ambiguity. Whereas ambiguity implies that the alternatives are known, uncertainty is somewhat more encompassing and implies that the alternatives are potentially unknown or even unknowable (Clampitt and Williams, 2005).

while few actively embrace it. However, this does not affect my reasoning as I focus on intra- and inter-group processes. Regardless of individual exceptions, uncertainty is generally perceived as cognitively and emotionally challenging because it creates a feeling of discomfort and weakness. Besides, researchers typically have not reported that tolerance for uncertainty systematically varies on the basis of gender, age, or education level (Furnham, 1995).

It is likely that contextually important uncertainties are particularly those that are self-conceptually important. Uncertainties that affect the self-concept can hardly be reduced by the acquisition of knowledge but rather by self-conceptual reorientation. The self-categorization process is ideally suited to this as it provides consensual alignment and mutual confirmation of in-group members' self-conceptually relevant beliefs, attitudes, and behavior. Simultaneously, the purposed differentiation from salient out-groups helps to define a prototype, which describes and prescribes how to behave and what to expect from the social environment (Hogg, 2000). Thus, the uncertainty reduction hypothesis generally predicts that uncertainty motivates self-categorization and psychological group formation (Hogg and Abrams, 1993; Hogg and Mullin, 1999). Specifically, individuals will be more likely to identify with an available self-inclusive social category as their subjectively perceived uncertainty increases.[15]

In the following section, I briefly outline previous work on uncertainty in organization theory in order to illustrate the nexus with the preceding discussion on the uncertainty reduction hypothesis.

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[15] Additional support for this view comes from Hofstede's work on cultural differences (1980, 1983, 1984). He argued that cultures differ in terms of their influence on uncertainty avoidance in people. For instance, socio-cultural rules, rituals, customs, educational standards, religious orientations, and technologies are cultural forces, which shape individual's responses to uncertainty. He found that individuals' tendency to reduce uncertainty by focusing on planning and the creation of stability was significantly correlated with the tendency to self-define by the depersonalized characteristics of their in-group rather than in terms of personal attributes and achievements. Speculating on the causality, he also reasoned that uncertainty promotes collectivism as it "drives" people to join groups.

4.4 Uncertainty in Organization Theory

Due to functional and economic factors, the concept of uncertainty is of critical importance in almost all formulations of organizations and management theories (e.g. Thompson, 1967; Lawrence and Lorsch, 1967; Galbraith, 1973; Williamson, 1975; Scott, 1987). Thompson (1967) noted on the centrality of uncertainty in organization theory: "Uncertainty appears as the fundamental problem for complex organizations, and coping with uncertainty, as the essence of the administrative process" (p. 159). Researchers studying uncertainty in organizational contexts usually choose either an external or internal perspective. The external, more macro-level approach focuses on sources of uncertainty, which come from the external organizational environment (e.g., competitive pressures or government regulations). Those who take the internal tact are concerned with the impact of internal dynamics (e.g., restructuring measures or promotion systems). Managerial thinking generally suggests that organizations can sustain their competitive success largely because its administrative efficiency regulates and controls future contingencies (Williamson, 1975, 1985). Thus, all managerial tools, like strategic planning schemes, clearly defined job responsibilities, or the formulation of objectives are eventually designed to reduce uncertainty or to mitigate its detrimental outcomes (Clampitt, DeKoch, and Cashman, 2000).[16]

In departing from the classical, rational conceptualizations of organizations, contemporary institutional theorists consider the behavior of organizations as neither the result of an internally directed, nor of an externally determined rationality. Their explanatory concept is largely perceptual and refers to the socially constructed nature of organizational realities, the creation of shared knowledge and belief systems (Meyer and Rowan, 1977; DiMaggio and Powell, 1983). Organizational rules and structures accrue from the requirement to provide behavioral guidance and to render the perception of individual contributions meaningful. More

[16] For reviews on uncertainty management, see Hogg and Mullin, 1999; Lind and Van den Bos, 2002; Van den Bos and Lind, 2002; Weary, Jacobson, Edwards, and Tobin, 2001.

specifically, defined means-to-end relations and standardized distribution of resources and activities constitute the essence of organizing (Scott and Meyer, 1994). Whereas the constructed reality is not claimed to be objective, the underlying view of uncertainty as an objective environmental phenomenon remains unchanged. In this context, uncertainty is considered a core motivation that drives mimetic isomorphism, i.e., it encourages cognitive and behavioral alignment of the organization members in order to accord the organization's legitimacy (Weitz and Shenhav, 2000). A considerable advantage of this approach lies in its independence of macro- and micro-perspectives on the organization insofar, as the need for consensual orientation in the social environment increases, regardless of whether the source of uncertainty is internal or external of the organization. This is largely consistent with the preceding discussion on the uncertainty reduction hypothesis, and supports its applicability in organizational contexts.

4.5 The Relationship Between the Need for Self-Esteem and the Need for Uncertainty Reduction

If it is safe to say that people do not only like to be certain about their place in the social environment but also to feel good about themselves, the question emerges how both motivations are related in social identity contexts. So far, there is no scientific consensus on the relation between both motives. While a number of commentaries imply that uncertainty reduction and the maintenance of stability may be a stronger group motive than self-enhancement (e.g., Brown, Collins, and Schmidt, 1988; Baumgardner, 1990; Campbell, 1990; Banaji and Prentice, 1994; Jost and Banaji, 1994; Jost, 1995), others contend that self-esteem is pursued only when a certain self-concept is secured (e.g., Sedikides and Strube, 1995; Taylor, Neter, and Wayment, 1995). Yet, a third group of researchers argues that the need

for uncertainty reduction and the need for self-esteem are unrelated and that it depends on the social context which motivation determines social identity processes (e.g., Hogg and Terry, 2000). In contrast to these scholars, empirical researchers in organizational contexts largely content themselves with an exclusive focus on the self-esteem hypothesis (e.g., Chattopadhyay, Tluchowska, and George, 2004). This is particularly surprising, as Marris (1996) already places uncertainty reduction at the motivational core of inter-group relations in organizational contexts. He argues that inter-group relations are a struggle to offload uncertainty onto other groups and thus construct a hierarchy of uncertainty with desirable high status groups characterized by low uncertainty.

In the following, I illustrate in unprecedented depth why individuals more fundamentally strive to reduce uncertainty and why the pursuit of self-esteem is related to, or even contingent on, self-certainty.

Inter-group comparison, reflecting a group's relative position on some evaluative dimension of comparison, can reduce uncertainty but not necessarily in a positive way. Only if a group's subjective position in relation to relevant comparison groups is high, it positively contributes to the self-esteem. In this case both core needs are satisfied simultaneously. Not less often, however, the evaluative outcome is negative.

Tajfel and Turner (1979) describe different *coping strategies*, which might be applied by members of socially devalued groups to sustain self-esteem. These include the individual's disidentification and subsequent attempt to affiliate with groups that are associated with more favorable expectations, various "socially creative" ways of modifying comparative dimensions or referential out-groups, and the more collective approach of challenging the out-group's legitimization to its superior position. Doosje, Ellemers, and Spears (1995) add that individuals may mitigate the effects of perceived inferiority by intra-group comparisons with in-

group members, who are less well off.[17] Blanz (1999) suggests that group members may resort to absolute standards or comparisons over time if these options provide more positivity. He also proposes re-categorization as a means to restore the positivity of a social identity: in-group members can either give up their social identity and self-categorize as belonging to a superior out-group or they split their group into smaller, hierarchically differentiated subgroups in order to self-categorize into one, which is comparatively superior. Noteworthy, there is empirical evidence for the psychological reality of all these self-esteem maintenance strategies (e.g., Blanz, 1999; Brown and Haeger, 1999, Brown and Middendorf, 1996; Doosje, Ellemers, and Spears, 1999; Ellemers, 1993; Mummendey, Kessler, Klink, and Mielke, 1999).

While these findings certainly have their merits, they neglect the external structure of the social environment as an integral feature of many social phenomena social realities. I take up the position that the external structure of social environments constrains the opportunities for socially creative re-evaluation processes and/or the increase in perceived positivity, which is likely to be of a rather temporary nature. Equally, the opportunities for an individual to dissociate from the present group and to associate with a more attractive group, respectively, are often subject to limitations. There are certain mechanisms, which I dwell on in the following that constrain the pursuit of self-esteem to a substantially larger extent than the need for uncertainty reduction.

First, the extent to which a group membership can help reduce subjective uncertainty about one's place in the social environment depends on the perception of the group as a coherent entity - a property that social psychologists refer to as entitativity (Campbell, 1958). Entitativity increases the predictability of self-conceptually relevant interaction processes, both within the in-group and with the out-group. However, when in-group entitativity is high, it is ceteris paribus more

[17] This strategy to reduce perceived inferiority may reasonably explain the phenomenon of mobbing at the workplace, which involves conscious psychological harassment and discrimination of an ostensibly weaker employee. Mobbing behavior can result in severe psychological and occupational consequences for the victim (Leymann, 1990).

difficult for individuals to move from one social group into a more favorable one.

Proposition 1:

The opportunity to affiliate with an individually more favorable social group is contingent on the target group's degree of entitativity.

Second, the process of self-categorization is based on perceived similarities and that individuals cannot arbitrarily feign these signals in order to gain entry into a more attractive group. Stable and clearly delineated inter-group relations in organizations typically further reduce the opportunities for upward social mobility. Even if similarities could be feigned, they would be self-deceptive and eventually pointless to enhance self-esteem.[18]

Proposition 2:

The opportunity to affiliate with an individually more favorable social group is contingent on the degree to which the individual's and target group members' consistently perceive critical characteristics as similar.

A third related limitation stems from the phenomenon that members of socially attractive groups are inclined to actively obstruct the entry of interested out-group

[18] Taylor and Brown (1988) have shown that certain illusions, such as unrealistically positive self-evaluations, exaggerated perceptions of control or mastery, and unrealistic optimism can be beneficial to mental health. I emphasize that self-deception in this context is conceptually very different. Instead of focusing on the individual, I refer to generalized social motives that extend to embrace the group, its prototype, and its members, because self and group are psychologically fused and because the group and its members validate each others cognitions and behaviors (Hogg, 1993). Therefore, feigned similarity is unlikely to be sustainably enhance self-esteem.

members. In order to keep their in-group exclusive and to prevent distinct group characteristics from diffusion, required criteria to gain entry into the superior group may be either objectively immutable (e.g. race, nationality) or difficult to accomplish by means of own effort (e.g., educational attainment, professional experience). The emotional value attached to a group membership may partly stem from its exclusiveness. In organizational contexts, status and power differentials are usually preserved by officially assigned competences and obligations.

Proposition 3:

The opportunity to affiliate with an individually more favorable social group is contingent on the entry barriers created by the target group members.

A fourth limitation to the individual choice of attractive groups refers to peer pressure and its underlying value system (Kandel and Lazear, 1992). Intra-group sanctions for any attempt to move into another group may be so powerful, that individuals feel impotent to leave their unfavorable group. The threat of being considered a "traitor" tends to prevent the creation of cognitive alternatives to the current group membership in order to preserve the status quo.

Proposition 4:

The opportunity to affiliate with an individually more favorable social group is contingent on the social pressure created by members in the current group.

A fifth limitation to the pursuit of positive self-esteem refers to the specificity of social identities. Social identities are at least partially group-specific to the extent that interaction is interpersonal (e.g., due to the proximity, similarity, and task

interdependence of in-group members). Even if individuals manage to gain entry into their target group, the attainment of a full-value group member status usually requires more than a discrete either-or-choice. In most contexts new members learn the established policies, general role expectations, behavioral norms, power structures, and so forth (Ashforth, 1985). This learning process is generally termed socialization. Moreover, they must learn to interpret fellow members' verbal and nonverbal responses in situated social interactions and accumulate experience in synchronizing their individual activities (van Maanen, 1979).[19] Certain processes even become so internalized that their successful execution happens unconsciously and cannot be verbally explained (Lippman and Rumelt, 1982). In reference to the implicit character of collectively held expertise, Weick and Roberts (1993) coined the term „collective mind". The essence of their argument is that in highly interactive teams any member only has access to a part of the overall stock of the team-based expertise because it is diffused among the team members.

This implies that membership duration tends to increase with group-specificity. An individual, who leaves the group has to bear not only the costs of lost emotional value attached to the respective group (which is likely to be compensated if the new group is socially more attractive), but also the loss or lost applicability of group-specific aspects like individual status and popularity or non-transferable knowledge. Likewise, when the group must fill its vacancy with new personnel the change in the group's composition is likely to impact the existing prototype and increase uncertainty. In-group members may anticipate this consequence and preventively raise the emotional and moral costs for any attempt to leave the group.

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19 At an organizational level this argument is considerably less applicable because the emergence of organizational identities is hardly based on interpersonal interaction. Organizational identities rather stem from those features that make the organization recognizable, legitimate its existence, and distinguish it from contextually salient other organizations (Albert and Whetten, 1985; Deephouse, 1999; Whetten and Mackey 2002; King, Felin, and Whetten, 2010). The emergence of its members's social identification is rarely contingent on interpersonal interaction but rather on a depersonalized, consensual prototype. This does not mean that all members voluntarily accept the prototype in a similar way. Individual sovereignty is compromised by strict roles and hierarchical control (King, Felin, and Whetten, 2010). If participation in the accomplishment of superordinate organizational goals is not instrumental to the satisfaction of the individuals' emotional, cognitve, social, and monetary needs, the individual can only adjust the valuation of the prototype, but not the prototype itself.

Generally, group-specific requirements for social identification reduce the group's permeability and, thus, the opportunities for upward social mobility. This suggests that group-specificity is positively correlated with properties of group distinctiveness. The emergence and sustenance of prototype clarity is less problematic, when there are fewer turnovers and more collectively held expertise. I strongly emphasize that while highly specific social identities do not necessarily enhance self-esteem, they are particularly attractive to those who are motivated to reduce uncertainty.

Proposition 5:

The opportunity to affiliate with an individually more favorable social group is contingent on the group-specificity of both the current and the target group's social identities.

Proposition 6:

Group-specificity of social identities reduces uncertainty but does not necessarily enhance self-esteem.

A sixth limitation to the individual choice of attractive groups relates to individuals' asymmetric information about their current in-group and a potential out-group. Individuals generally possess more reliable information about their in-group than about the contextually salient out-group. In social identity contexts the knowledge about the out-group will usually be confined to stereotypical information. Scholars consistently contend that rationally bounded individuals rely on such heuristics, which may yield subjectively satisfactory but objectively unreasonable judgments (Simon, 1957; Cyert and March, 1963; March and Simon, 1958; Kahneman, Slovic, and Tversky, 1982). Stereotypes work from time to

time, but they can also be misleading. Likewise, the representative heuristic (Kahneman et al., 1982) in which judgments are based on the degree to which X is representative of Y, may be relevant in inter-group situations.

The information deficiency toward the out-group implies that individuals need to take an increased risk into account when they consider moving into another group. In view of the motivation to reduce uncertainty about the self, information asymmetries between the current in-group and a potential out-group may be a reasonable explanation for an individual's tendency to prolong the existing membership. In contrast to the other limitations discussed, information asymmetries do not necessarily refer to a limitation, which cannot be altered by the individual and must thus be accepted. Information asymmetries rather reduce the individual's willingness to take the risk and make the effort to become a member of a more attractive group.[20]

Proposition 7:

The willingness to affiliate with an individually more favourable social group is contingent on informational asymmetries between in-group and out-group.

Figure 1 illustrates both the sequential relationship between the need for uncertainty and the need for self-esteem and the limitations to individual pursuit of self-esteem according to the previous discussion.

[20] Similarly, individual responsiveness and adaptability to dynamics in the social environment may be decelerated by inertia, i.e., the potentially irrational reluctance to change the status quo. Hannan and Freeman (1984) claim that this propensity is stronger in highly structured social realities like organizations, which typically constitute an inter-group context where group relations are stable and clearly.

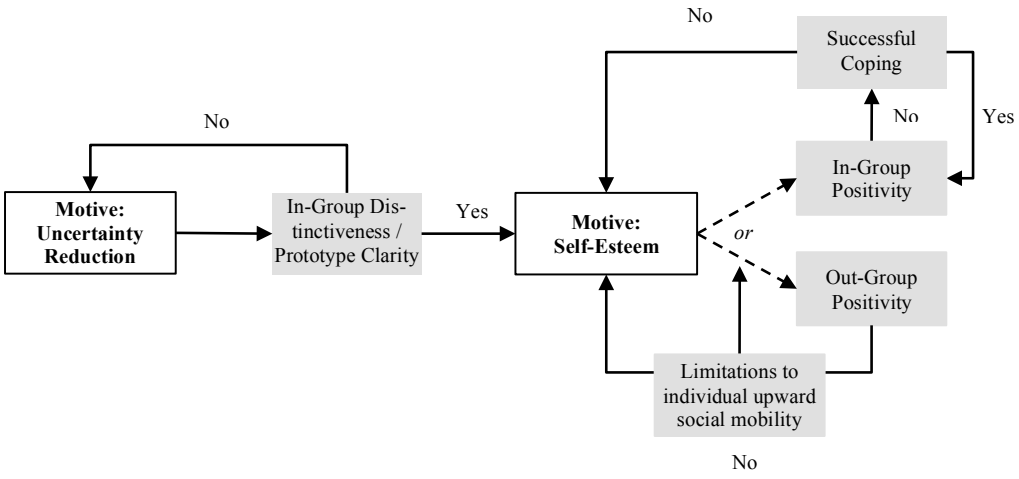

Figure 1: A Heuristic Model of the Relationship between the Need for Uncertainty Reduction and the Need for Self-Esteem in Social Identity Processes.

I conclude from the elaboration that in an inherently dynamic social environment, where social identity processes must be responsive to inter-group dimensions of immediate comparative contexts, the individual assessment of the current state of social identity requires repeated updating in order to keep uncertainty reduced. This is consistent with Samson's (1978) proposition that individuals try to manage their lives in order to establish a sense of continuity in their identity (identity mastery). Although there is no final conclusive answer to the question "Who am I and what does this imply?", an awareness of the status quo can be considered prerequisite for answering the logically subsequent question "Who do I want to be and what would that imply?" (i.e., the pursuit of self-esteem). As I have discussed, the latter question should be more realistically adjusted into "Given my perceived opportunities, who do I want to be and what would that imply?"

In support of my argumentation, Reid and Hogg (2005) find that self-conceptually uncertain individuals are motivated by uncertainty reduction to identify with a group, regardless of whether the group is of low or high status. Self-conceptually certain individuals, on the contrary, are primarily motivated by the prospect of an enhanced self-esteem to identify with high- than with low-status

groups. Wilson, Centerbar, Kermer, and Gilbert (2005) provide additional support for the validity of my reasoning by showing that people even want to avoid uncertainty when it prolongs pleasurable experiences.

4.6 Motivational Consequences

So far I have focused on how the external structure of the social environment limits the pursuit of self-esteem as a motive for group affiliation. According to my argumentation the need for uncertainty reduction and the need for self-esteem are sequentially interrelated. It is important to note that my approach differs from Maslow's (1943) pyramidal conceptualization of individual needs. I refer to generalized social motives that extend to embrace the group, its prototype, and its members, because self and group are psychologically fused and because the group and its members validate each other's cognitions and behaviors (Hogg, 1993).

Comparisons between current and possible, future-oriented social identities may have important motivational consequences that operate with differing urgency depending on the specific nature of the inter-group relation.

If a group primarily feels that its distinctiveness is threatened, this perception will likely arouse the motivation to reduce uncertainty. In seeking uncertainty reduction, people probably pay as much attention to clarity of social structural differentiation among groups as to in-group prototype clarity itself although the latter is the most direct source of self-definitional information. According to the principle of meta-contrast, prototype clarity is contingent on both intra-group homogenization and inter-group differentiation. Potential consequences are increased in-group favoritism, depersonalized social attraction for fellow in-group members, and satisfaction with stable social structural relations among groups. In an attempt to sustain or restore a distinct prototype within a homogenous and consensual group, prototypically central and, thus, more influential in-group members will be

inclined to reject prototypically marginal in-group members. “Negative” deviants, who are inclined toward the referential out-group prototype will be evaluatively downgraded, much like “positive” deviants, who are aprototypical in terms of their surpassing contribution to the group’s positivity. Both are equally dysfunctional as they jeopardize the in-group’s prototype clarity.

Proposition 8:

If group distinctiveness is threatened, the need for uncertainty reduction becomes more salient. In-group members will protect or strive for prototype clarity.

If the group’s distinctiveness is perceived as stable but the evaluative positivity is under threat, the motivation to enhance self-esteem is likely to be aroused. In such cases “negative” deviants will be similarly rejected but “positive” deviants will be very welcome in-group members. The partial prototype diffusion will be accepted because it is situationally beneficial. In the long run, however, individual overachievement must be attributable to the group, reflecting relatively more positively on the valence of the in-group prototype and thus ultimately on self-esteem. The prospect of collectively increasing the in-groups positivity or of becoming a member of a superior group, respectively, may energize substantial effort. Likewise, it may promote patience with presently unfavorabe conditions by directing the perception on potential progress and improvement.

Proposition 9:

*If group distinctiveness is perceived to be stable, the need for self-esteem becomes more salient. In-group members will tolerate situationally beneficial prototype diffusion***.**

4.7 Contextual Factors in Organizational Performance

In this section, I aim to show how my extended view of social identity theory helps to understand the performance effects of a broad range of contextual factors in organizational design, comprising relative-pay schemes, internal labor markets, the integration of tacit knowledge, and the more complex processes associated with team-level diversity.

4.7.1 Relative-Pay Schemes

Proposition 9 states that single "positive" deviants, who jeopardize their in-group's prototype clarity will only be tolerated if their contribution is situationally beneficial and if the group's distinctiveness is perceived as sufficiently stable. In the long run, however, individual overachievement must be attributable to the group, reflecting relatively more positively on the in-group prototype.

Relative-pay schemes, which incentivize all workers to become "positive" deviants by outperforming their fellow in-group members (e.g., Lazear, 1989), are likely to undermine the group's perceived distinctiveness or to impede the emergence of a clear prototype, respectively. Personal identities will be more salient than the work team's social identity because individual characteristics are more significant to the conception of a situation in which pay is merely based on individual merits.

It is well known that relative-pay schemes provide adverse incentives to sabotage competitors (Lazear and Rosen, 1981; Lazear, 1989). I argue that, in addition, the lost potential to benefit from collective effort to establish group distinctiveness and to increase the in-groups positivity must be taken into account.

Proposition 10:

Relative pay-systems undermine the group's perceived distinctiveness or impede the emergence of a clear prototype, respectively.

4.7.2 Internal Labor Markets

Another contextually relevant characteristic of organizations is whether the internal labor market is open or closed. In open labor markets the employee-organization relationship involves higher risk of termination, and vacancies are more likely to be filled through staff hired from outside the firm. Due to the employees' expectation to be employed by several organizations, they are inclined not to develop a strong attachment to any employer. In such a culture of generalists with a prevalence of performance-based remuneration schemes, they develop more portable skills.

In a closed internal labor market vacancies are mostly filled through internal promotion of existing staff within the firm. Careers typically take place in only one organization and remuneration schemes are largely based on seniority. Employees develop a strong attachment to their employer and are, thus, more willing to invest in organization- or group-specific human capital. There are fewer turnovers and more collectively held expertise (Baker, Jensen, and Murphy, 1988; Stroh, Brett, Baumann, and Reilly, 1996).

This suggests that closed labor markets facilitate the emergence and sustenance of prototype clarity and group distinctiveness. Thus, organizations with closed labor markets can better suit the need to reduce uncertainty and they are more likely to benefit more from their subunits effort to collectively increase their in-groups positivity.

Proposition 11:

Organizations with closed labor markets can better suit the need to reduce uncertainty and they are more likely to benefit more from their subunits effort to collectively increase their in-groups positivity than organizations with open labor markets.

4.7.3 Tacit Knowledge Integration

The knowledge-based theory of the firm, introduced by Grant (1996), proposes that a firm's key dynamic capability is its ability to integrate knowledge from different sources. According to Grant, the integration of tacit knowledge is of particular importance because it resides in individuals and cannot be explicitly contracted. It is hardly imitable by competitors and can thus generate a sustainable competitive advantage. However, a critical element for the integration of tacit knowledge, which was not addressed by Grant (1996), relates to the *willingness* to share tacit knowledge between different organizational subunits.

Given the in-groups tendency to overdifferentiate from similar, proximal, or salient out-groups (Tajfel and Turner, 1986), this may be particularly true if the knowledge integration concerns two groups at the same level within the organizational hierarchy. Competitively referential groups will feel threatened by a deterioration of their in-group's position in inter-group competition over scarce organizational resources. Their participation in inter-group activities will be characterized by group isolation rather than inter-group convergence and exchange.

When the groups are hierarchically structured defensive biases in differentiation by the subordinate group are less likely - at least as long as the hierarchical structure is viewed as legitimate or institutionalized (Caddick, 1982; Tajfel and Turner, 1986).

Generally, any organizational subunit faces a trade-off associated with tacit

knowledge integration. On the one hand, the in-group's distinctiveness, as a prerequisite for uncertainty reduction, may be compromised by the provision of tacit knowledge. On the other hand, tacit knowledge integration is no unilateral process but happens in exchange with another group. The gained knowledge may promote the in-group's productivity, its perceived positivity, and eventually its members' self-esteem.

Proposition 12:

Similar, proximal, or salient, but particularly competitively referential groups will tend to resist tacit knowledge integration due to biases in differentiation.

4.7.4 Team Diversity

Following Harrison and Klein (2007), team diversity may be conceptualized as the distribution of differences of a common characteristic across team members. Researchers in this area commonly distinguish between relations-oriented and task-oriented diversity (Jackson, Joshi, and Erhardt, 2003; Joshi and Roh, 2009). Relations-oriented diversity refers to "surface" characteristics, such as gender, age, or ethnicity, which are immediately observable. Task-oriented diversity involves diversity of "deeper" characteristics, such as knowledge or skills, which are not directly observable. A so far unresolved puzzle is why studies on team-level diversity regularly find relations-oriented diversity to harm team performance, while task-oriented diversity tends to promote team performance.

Generally, relations-oriented diversity makes it more difficult to find consensual categorical attributes, which align the in-group members' prototypical beliefs, attitudes, feelings, and behavior. Joshi and Roh (2009) argue that the lack of prototype clarity leads group members to overemphasize inter-group differences with

salient out-groups in order to reduce the own perceived uncertainty. The resultant discriminatory behavior against out-groups is largely unproductive and, thus, explains the negative influence of relations-oriented diversity on team performance.

I argue that the low degree of distinctiveness also undermines the in-group members' willingness to collectively engage in productive activities. Contingent on the opportunities for individual social mobility, the members will look for alternative groups that are more distinct and, if possible, positively valued. In line with my reasoning, van Knippenberg, De Dreu, and Homan (2004) find relations-oriented homogeneity to be positively correlated with self-categorization processes.

Proposition 13:

Relations-oriented team diversity increases unproductive out-group discrimination and undermines the in-group members' willingness to collectively engage in productive activities.

Task-oriented diversity attributes, which are associated with skill-based and informational differences among work group members, are assumed to constitute a team's cognitive resource base (Jackson, May, and Whitney, 1995). More specifically, task-oriented diversity bears on intra-group processes, such as the exchange of information and perspectives, mutual feedback, and knowledge integration. If there are task-interdependent complementarities, these elaboration-based processes can explain the positive performance effects of task-oriented diversity at the team-level. I would like to add an intuitive explanation that derives directly from the extended social identity framework.

Following Proposition 9, I argue that task-oriented diverse teams are more tolerant to partial prototype diffusion as long as it is consistently perceived as situationally beneficial. Besides, individual overachievement must, in the long term, be

attributable to the group. Quite contrary to tacit knowledge integration with another organizational subunit, there is no risk to compromise the in-group's distinctiveness if all members provide their individual knowledge. If the group's distinctiveness is perceived as sufficiently stable, the prospect of collectively increasing the in-group's positivity by exploiting the team's potential in task-interdependent complementarities may energize substantial effort.

Proposition 14:

Task-oriented team diversity may energize substantial effort to collectively increase the in-group's positivity if the distinctiveness is perceived as sufficiently stable and if the potential in task-interdependent complementarities is consensually realized.

4.8 Discussion and Conclusion

Social identity as a sense of self, derived from membership in social groups, helps people to navigate their social lives, work-wise or other. The highly constitutive role of professional attainment in the evaluation of self and others is hardly surprising for two basic reasons. First, most people spend a major part of their lifetime at work. Second, most working people do not do their job in isolation but rather as part of a team with interdependent tasks and shared responsibility for outcomes.

In this chapter I have made an attempt to address associated questions organizations are increasingly confronted with, such as how employees align individual and group interests so that they collectively engage in activities that benefit their group, or how different organizational subunits interact in a collaborative way. My

goal was to extend the conventional wisdom about how collective self-conception influences and is influenced by organizational processes. I provided a careful in-depth discussion on the relationship between the underlying core motives for group affiliation, i.e., the need for self-esteem and the need for uncertainty reduction. So far, many researchers have tended to strongly emphasize the need for self-esteem, while neglecting the need to reduce uncertainty about one's social identity. The theoretical analysis, however, revealed that both motives for social identity processes can reasonably be assumed to be *sequentially interrelated.* The need for uncertainty reduction was found to be the more fundamental motive. I showed that the need for self-esteem is often subject to a set of limitations, particularly in highly structured social environments like organizations. Moreover, I elaborated on the differing conditions for activation and the respective motivational consequences of both needs and derived a variety of rather general, but testable, propositions, which help frame future research directions in the study intra- and inter-group processes in organizational contexts.

In a subsequent step towards a better understanding of social identity processes I applied the extended theoretical framework to specific contextually relevant aspects of organizational design. Prior applications of social identity theory have proved to be incapable of explaining largely inconsistent findings (e.g., Joshi and Roh, 2009). Specifically, I (i) explain when relative-pay schemes tend to improve or decrease team productivity, (ii) make predictions about the differing social identity processes in open and closed internal labor markets, (iii) make predictions about the ease of tacit knowledge integration in firms, and (iv) reconcile previously contradicting results on relations-oriented and task-oriented team diversity measures.

I am confident that my contribution to a better understanding of social identity processes offers a lot of potential for future research. First and foremost, empirical work should evaluate the validity of the theoretical propositions. While most of the propositions build on previous work in the area of social psychology, I need reliable field evidence from organizational contexts.

Another promising avenue for future research concerns the investigation of the relationship between an individual's multiple social identities. Van Knippenberg et al. (2004) acknowledge that the number of distinct identities and their specific content vary from person to person. Given that employees' psychological well-being depends on their portfolio of social identities, future work should consider how multiple group memberships within the organization (e.g., in different project teams and/or work teams), and outside the organization (e.g., family, friends) interfere with each other. Particularly for long-term employments, the employers should have a direct interest in sufficiently diversified portfolios to reduce the risk that their employees experience a personal crisis. Results from a recent survey by the polling firm Gallup indicate the demand for action in the field (Terpitz, 2009). For instance in Germany, more than four out of five employees professed to be in a state of "inner resignation". They were more frequently ill and exhibited substantially less creativity in their jobs. Considering the well documented, positive correlation between organizational identification, work satisfaction, and individual productivity as well as potential additional replacement costs for personnel selection, contracting, training and so forth, the economic relevance of this issue is immense.

A related direction for future work alludes to the potential conflict between social identities and situational strength. According to Meyer, Dalal, and Hermida (2010), situational strength refers to "implicit or explicit cues provided by *external* entities regarding the desirability of potential behaviors" (p. 122) [my italics]. The idea behind situational strength is expressed in the notion that "the situation (or various characteristics thereof) might restrict the expression of individual differences" (p. 122). Bureaucratic organizations, which emphasize individual accountability and the predictability of social behavior in order to control and direct the activities of their organizational members (March and Simon, 1958), are particularly characterized by a high degree of situational strength. Situational strength can be conceptualized as a depersonalized prototype, which aligns behavior. However, it does not consensually emerge from the group members' interpersonal in-

teraction. It is rather externally imposed and provides prescriptive behavioral guidance. To the extent that organizational members perceive situational strength as not instrumental to the satisfaction of their social needs, they can only adjust their valuation of the prescribed prototype, but not the prototype itself. The benefit to the organization remains open to scrutiny. On the one hand, a high degree of situational strength may satisfy the need for uncertainty reduction. On the other hand, it may conflict with internally emerged group prototypes and/or refuse the group to collectively increase its perceived positivity. I thus see an important task for future work in investigating the relationship between social identity processes and situational strength.

Moreover, I believe that the theoretical framework would prove helpful to gain further insight in group empowerment and its associated processes. Group empowerment might reduce the perceived uncertainty as it reduces the power and status differential with superordinate out-groups and, thus, improves the in-group's relative position in the organizational hierarchy. Equally, group empowerment may provide a "toolkit" for group members to collectively increase the perceived positivity and satisfy the need for self-esteem. At the same time, it is not clear how collectively caused negative outcomes are attributed. It would be interesting to investigate the resultant social identity processes if team members are directly responsible for unfavorable outcomes.

The last promising research avenue I want to point out concerns the phenomenon of mobbing at the workplace. Mobbing involves conscious psychological harassment and discrimination of ostensibly weaker co-workers and can result in severe psychological and occupational consequences for the victims (Leymann, 1990). An extensive discussion is beyond the scope of this chapter, but the basic line of reasoning might be that discriminatory behavior against in-group members is a coping strategy by fellow members of socially devalued groups to mitigate their perceived inferiority. Possibly due to insufficient group distinctiveness, personal identities are more salient than the work team's social identity. Without a consensual prototype, which induces behavioral alignment, individual characteris-

tics become more significant to the conception of a situation and make room for interpersonal discrimination.

5 Summary and Outlook

Virtually every type and size of organization commits substantial resources to team-based initiatives because individuals working as part of a team with interdependent tasks and shared responsibility for outcomes generally achieve something beyond the capabilities of individuals working alone. More specifically, organizations increasingly rely on the their employees' diverse but collaboratively related competencies, skills, knowledge, and experiences in order to respond quickly and adaptively to highly dynamic circumstances. While the explanations *why* business success largely depends on teamwork is intuitive and unquestioned, the explanations *how* organizations can sustain their competitive edge are relatively opaque, and still largely open to scrutiny.

The aim of this dissertation was to contribute to the literature on teams in organizational contexts by addressing three specific issues that currently challenge scholars. In two empirical approaches and one conceptual, I have gained further insight in the underlying processes of team effectiveness.

In chapter 2 "Specific Human Capital as a Source of Superior Team Performance", I investigated whether a team's shared experience in working together (i.e., its stock of team-specific human capital) positively affects team performance. Using professional soccer teams from the German *Bundesliga* as an example of highly interactive teams, I employed the number of deployments in league matches as a proxy variable for team-specific human capital. In contrast to previous studies, which measure pure tenure or rely on survey data, the specification better

reflects team members' cumulative experience in cooperating. Besides, my approach is likely to be more conclusive because the empirical analysis is based on a larger sample than that used by any other related study.

Holding a team's stock of general human capital (i.e., playing talent) and other potential drivers constant, I found support for a positive relationship between shared experience and team performance. I were able to show that the relationship is not linear but concave in shape, which can convincingly be explained by learning effects. Moreover, the results indicate that team members should not only be retained in the team but should also be similarly experienced in playing for the current team.

The finding that a player's specific relationships with teammates matter implies that the loss of team-specific human capital in the case of a transfer should be accounted for in any club's investment decision regarding the engagement of new players. The failure to consider this aspect may explain the occasional observation that a soccer player turns out to be a flop after a transfer to a new team because he does not meet expectations.

In chapter 3 "How Expectations Affect Managerial Change", I investigated the antecedents of the decision to terminate a managerial employment. Like in chapter 2, I chose the domain of soccer over other industries because of the considerable advantages for empirical testing. Thus, I considered the head coach to be the analogy of a manager in a firm. The empirical evidence of previous studies on this economically highly relevant topic is largely contradictory. There is yet a general consensus on the critical importance of performance expectations, but the problem of specification has only deficiently been solved so far. A related drawback of many existing studies is that hey are incapable of estimating deviations from expectations because they lack objective and reliable performance data that the team leader can be held accountable for.

I managed to overcome these obstacles by using detailed team performance data from the German *Bundesliga* and an innovative specification of performance

expectations based on supplementary betting odds. The results conclusively demonstrate that (i) the probability of a coach dismissal increases with expectations, even after controlling for the actual performance of he team and that (ii) coaches are more likely to be fired if they fail to meet expectations, compared to peers with equal performance who meet or beat expectations. Thus, expectations affect managerial change even beyond the performance.

Future research should expand my approach by including matches other than *Bundesliga* ones, i.e., national and international cup matches. I argue that the coach's job tenure should depend on all his team's performances throughout his spell, except for friendly matches. In order to validate the generalizability of the findings, my approach should be applied to other leagues and other teams sports.

In chapter 4 "Motives for Social Identity Processes in Organizations", I have made an attempt to challenge conventional wisdom on the motives for social identity processes in organizational settings. Drawing on social identity theory, my aim was to advance the theoretical framework in order to increase the understanding of intra- and inter-group processes at work.

I provided a careful in-depth discussion on the relationship between the underlying core motives for group affiliation, i.e., the need for self-esteem and the need for uncertainty reduction. So far, many researchers have tended to strongly emphasize the need for self-esteem, while neglecting the need to reduce uncertainty about one's social identity. My analysis, however, revealed that both motives for social identity processes are likely to be *sequentially interrelated.* The need for uncertainty reduction was found to be the more fundamental motive. I showed that the need for self-esteem is often subject to a set of limitations, particularly in highly structured social environments like organizations. Moreover, I elaborated on the differing conditions for activation and the respective motivational consequences of both needs and derived a variety of rather general, but testable, propositions, which help frame future research directions in the study intra- and inter-group processes in organizational contexts.

In a subsequent step towards a better understanding of social identity processes I applied the extended theoretical framework to specific contextually relevant aspects of organizational design. Prior applications of social identity theory have proved to be incapable of explaining largely inconsistent findings (e.g., Joshi and Roh, 2009). Specifically, I am able (i) to explain when relative-pay schemes tend to improve or decrease team productivity, (ii) to make predictions about the differing social identity processes in open and closed internal labor markets, (iii) to make predictions about the ease of tacit knowledge integration in firms, and (iv) to reconcile previously contradicting results on relations-oriented and task-oriented team diversity measures.

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